MCAT2015

BEHAVIORAL SCIENCES REVIEW

AAMC

This document is created by MCATBROS
@MCATBROS (Instagram/Twitter)
facebook.com/groups/mcatbros

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Sensory Perception

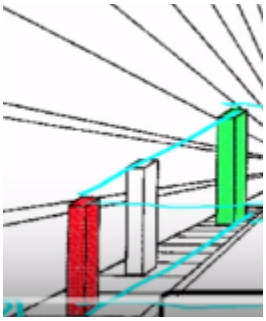
Visual Cues

- When we look at something, we need to make inferences
- Visual cues allows us to **perceptually organize** by taking into account the following cues: depth, form, motion, constancy
- Humans have two eyes which allow them to receive visual cues from their environment by **binocular cues**. These give them a sense of **depth**.
    - This gives them **retinal disparity.** Eyes are ~2.5 inches apart which allows humans to get slightly different views of objects of world around. Gives humans an idea on depth.

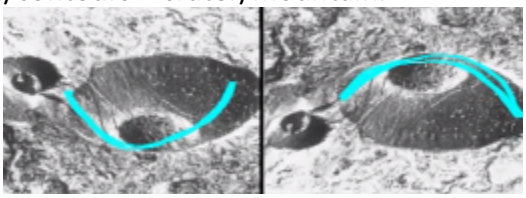
    - **Convergence**: Gives humans an idea of depth as well based on how much eyeballs are turned. Gives humans a sense of depth.
        - Things far away – muscles of eyes relaxed.
        - Things close to us – muscles of eyes contract.
- Humans also have visual cues they receive which they do not need two eyes for. These are **monocular cues**.
    - These give humans a sense of **form** of an object
        - **Relative size-** Can infer with one eye. The closer an object it is perceived as being bigger. Gives us an idea of form.

- **Interposition (overlap)-** Perception that one object is in front of another. An object that is in the front is closer.

- **Relative height-** things higher are perceived to be farther away than those that are lower.



- **Shading and contour-** using light and shadows to perceive form depth/contours – crater/mountain.



- Monocular cues can also give a sense of **motion**
  - **Motion parallax**- "relative motion" Things farther away move slower, closer moves faster.
- Monocular cue of **constancy**
  - Constancy – Our perception of object doesn't change even if the image cast on the retina is different. Different types of constancy include size constancy, shape constancy, color constancy.
    - **Size Constancy:** One that appears larger because its closer, we still think it is the same size.
    - **Shape Constancy:** a changing shape still maintains the same shape perception.

    - Ex. A door opening means the shape is changing. But we still believe the door a rectangle
- **Color Constancy:** despite changes in lighting which change the image color falling on our retina, we understand (perceive) that the object is the same color.

Sensory Adaptation

- **Sensory adaptation**: Our senses are adaptable and they can change their sensitivity to stimuli.
    - Hearing adaptation - **inner ear muscle**: higher noise = muscle contract (this dampens vibrations in inner ear, protects ear drum.) Takes a few seconds to kick in! So does not work for immediate noises like a gun shot, but it works for being at a rock concert for an entire afternoon
    - Touch - temperature receptors desensitized over time.
    - Smell – desensitized receptors in your nose to molecule sensory information over time.
    - Proprioception – is the sense of the position of the body in space i.e. "sense of balance/where you are in space."
        - Experiment: goggles that make everything upside down and the perception of the world, and eventually you would accommodate over time, and flip it back over.
    - Sight – down regulation or up regulation to light intensity.
        - Down regulation: light adaptation. When it is bright out, pupils constrict (less light enters back of eye), and the desensitization of rods and cones become desensitized to light)
        - Up regulation: dark regulation. Pupils dilate-, rods and cones start synthesizing light sensitive molecules

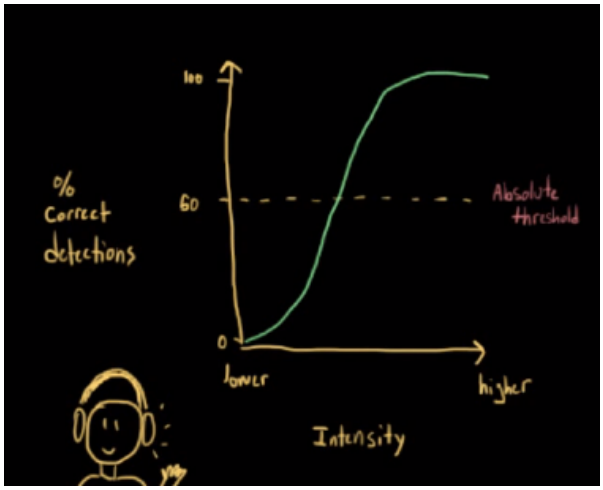
Weber's Law

- 2 vs. 2.05 lb weight feel the same.
- 2 vs. 2.2 lb weight difference would be noticeable.
- The threshold at which you're able to notice a change in any sensation is the **just noticeable difference (JND)**
- So now take 5 lb weight, in this case if you replace by 5.2 weight, might not be noticeable. But if you take a 5.5 lb it is noticeable.
- I = initial intensity of stimulus (2 or 5 lb), **Δ**I = JND (0.2 or 0.5).
- Thus, **Weber's Law** is:
    - **ΔI (JND)/I (initial intensity) = k (constant)**
    - ex. 0.2/2 = 0.5/5 = 0.1, change must be 0.1 of initial intensity to be noticeable
- If we take Weber's Law and rearrange it, we can see that it predicts a **linear relationship** between incremental threshold and background intensity.

- **ΔI** = Ik.
- If you plot I against **ΔI** it's constant

Absolute Threshold of Sensation

- **Absolute threshold of sensation**: The minimum intensity of stimulus needed to detect a particular stimulus **50%** of the time.

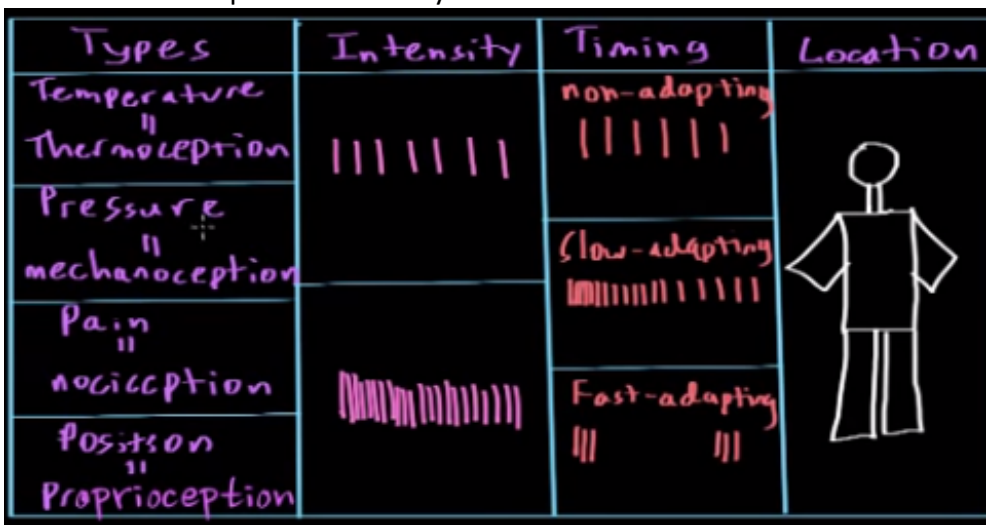


- At low levels of stimulus, some subjects can detect and some can't. Also there are differences in an individual.
- Not the same as the **difference threshold** (JND – Just Noticeable Difference) – that's the smallest difference that can be detected 50% of the time. Related but different concepts.
- Absolute threshold can be influenced by a # of factors. Not a fixed unchanging number. Particularly, it is influenced by a variety of Psychological states.
  - Expectations – ex. Are you expecting a text.
  - Experience (how familiar you are with it) – ex. Are you familiar of the phones text vibration sound.
  - Motivation – ex. Are you interested in the response of the text
  - Alertness – Are you awake our drowsy. Ex. You will notice text if you are awake
- **Subliminal** stimuli – stimuli below the absolute threshold of sensation.

Somatosensation

- Receive information about the types of somatosensation, the *Intensity, Timing, and Location*
- **Types:** Temperature (**thermoception**), pressure (**mechanoception**), pain (**nociception**), and position (**proprioception**)
- **Intensity –** how quickly neurons fire for us to notice. Slow = low intensity, fast = high intensity.

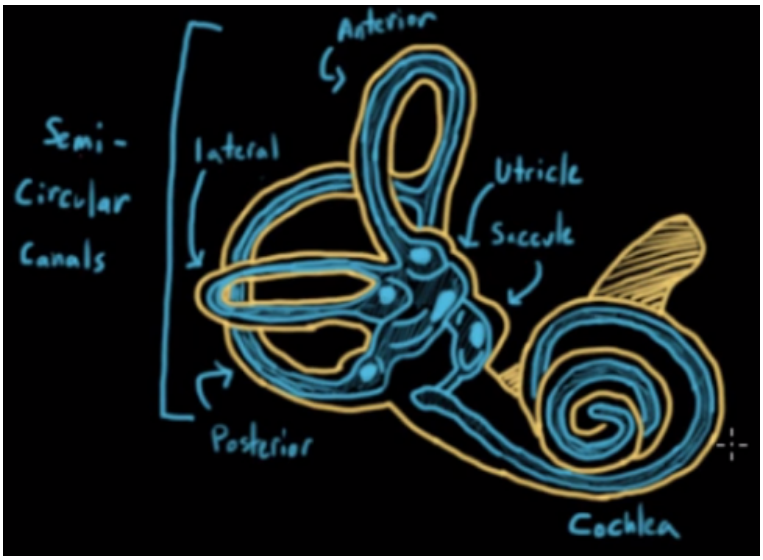
- **Timing:** Neuron encodes 3 ways for timing: non adapting, fast adapting, or slow adapting
    - **Non-adapting**- neuron consistency fires at a constant rate
    - **Slow-adapting** - neuron fires in beginning of stimulus and calms down after a while
    - **Fast-adapting** - neuron fires as soon as stimulus start…then stops firing. Starts again when stim stops).
- **Location:** Location-specific stimuli by nerves are sent to brain. Relies on dermatomes.



*Note: This graph doesn't relate rows to columns, read columns separately

The Vestibular System

- A type of sensation. <u>Balance</u> and spatial orientation
- Comes from both inner ear and limbs.
- Focus on **inner ear** - in particular the **semicircular canals** (posterior, lateral, and anterior; each orthogonal to each other)
- Canal is filled with **endolymph**, and when we rotate the fluid shifts in the semicircular canals – allows us to detect what direction our head is moving in, and because we can detect how quickly the endolymph is moving we can determine the strength of rotation.
- **Otolithic organs** (utricle and saccule) help us to detect linear acceleration and head positioning. In these are $CaCO_3$ (Calcium carbonate) crystals attached to hair cells in viscous gel. If we go from lying down to standing up, they move, and pull on hair cells, which triggers AP. These would not work very well w/o gravity! Buoyancy can have effects as well, particularly without visual cues on which way is up/down.
- Also contribute to dizziness and vertigo (when you or objects around you are moving when they are not)
    - Endolymph doesn't stop spinning the same time as we do, so it continues moving and indicates to brain we're still moving even when we've stopped – results in feeling of dizziness.



Signal Detection Theory – Part 1

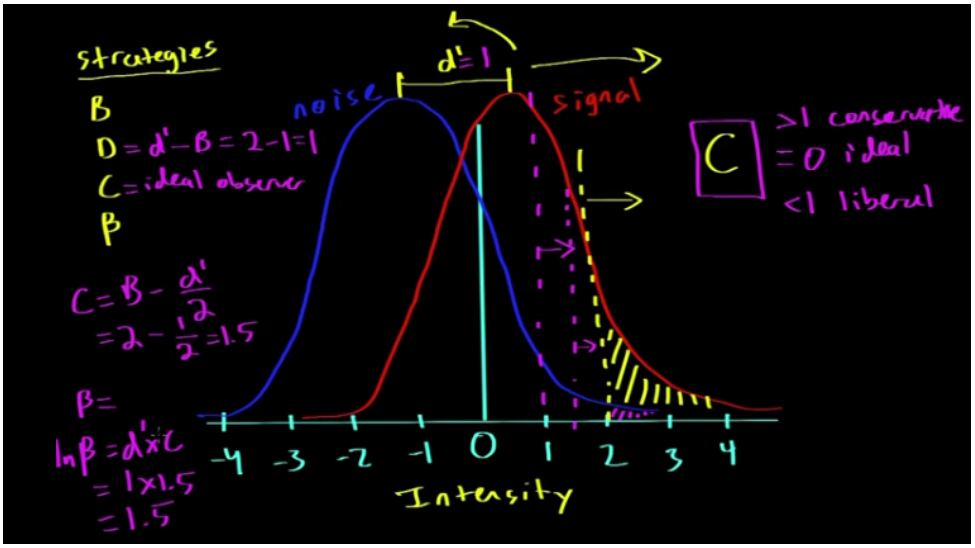
- **Signal Detection Theory:** Looks at how we make decision under conditions of uncertainty – discerning between important stimuli and unimportant "noise"
- At what point can we detect a signal
    - Origins in sonar – is signal a small fish vs. large whale.
    - Its role in psychology – Imagine being given a list. Then a second list. Now experimenter asks, which words on the second list were on the first. Person has to have uncertainty as they are not sure whether a certain word is exact or similar than the one in the first list. (Which words on second list were present on first list.)
    - Real world example – traffic lights. It's foggy day & you have to decide when to start driving. How strong does a signal have to be for you to drive? Signal is present or absent (red).
    - Options: hit/miss/false alarm/correct rejection
        - ***Hit***, the subject responded affirmative when a signal was present,
        - ***False Alarm***, the subject perceived a signal when there was none present;
        - ***Correct Rejection***, a correct negative answer for no signal
        - ***Miss***, a negative response to a present signal

*Note: Do not mistake this for Type I/Type II errors. This is different terminology.

- Strength of a signal is variable **d'**, and **c** is strategy
  - **d': Strength**
    - hit > miss (when there is a strong signal),
    - miss > hit (weak signal)
  - **c: strategy**
    - 2 strategies
      - **Conservative strategy** - always say no unless 100% sure signal is present. Bad thing is might get some misses.
      - Or **liberal strategy**- always say yes, even if get false alarms.

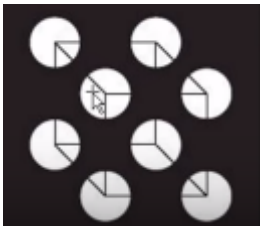
Signal Detection Theory – Part 2

- For any signal, have **noise distribution** (background). And get a second graph – the **signal distribution**.
  - The **difference between** means of the two is **d'**. So if signal shifted to right, d' would be big and easy to detect. If left, d' very small and more difficult to detect.
  - X-axis has intensity.
  - The **strategy C** can be expressed via choice of threshold – what threshold individual deems as necessary for them to say Yes vs. No. Ex. B, D, C, beta, just diff variables.
  - If we were to use the strategy B, let's say choose this **threshold** → 2. So anything > 2 will say Yes, anything <2, say No. So probability of hit is shaded yellow, and false alarm is purple.
  - D strategy: D = (d'- B), so let's say d' in this example is 1, so 2-1=-1. So if we use D strategy, anything above -1 = Yes; anything below -1 = No.
  - C strategy is an ideal observer. Minimizes miss and false alarm. C = B – d'/2. So in our example, it's 2- ½ = 1.5. So anything above a 1.5 is YES, anything below 1.5 is NO.
    - When C = 0, participant is ideal observer. If <1 → liberal. If >1 → conservative.
  - Beta strategy: set value of threshold to the ratio of height of signal distribution to height of noise distribution, i.e. ln beta = d' x C = 1 x 1.5 = 1.5. So e^1.5 = beta = 4.48.



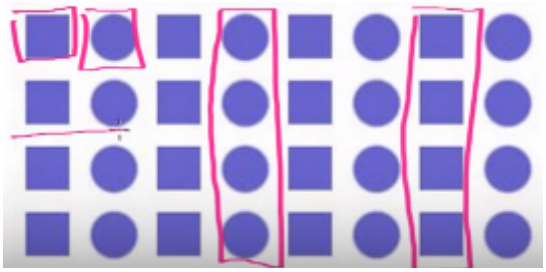
Bottom-Up vs. Top-Down Processing

- **Bottom up Processing:** Begins with stimulus. Stimulus influences what we perceive (our perception).
    - No preconceived cognitive constructs of the stimulus (never seen it before)
    - Data driven. And the stimulus directs cognitive awareness of what you're looking at (object)
    - Inductive Reasoning. Always correct.
- **Top-down Processing:** uses background knowledge influences perception. Ex. Where's waldo
    - Theory driven. Perception influenced by our expectation
    - Deductive Reasoning
    - ex. creating a cube when it's not there! Not always correct.

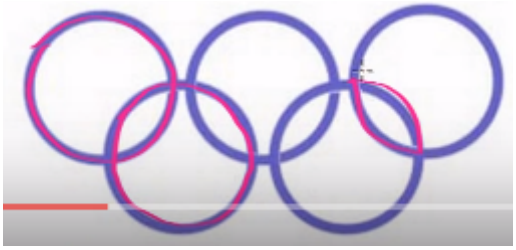


Gestalt Principles

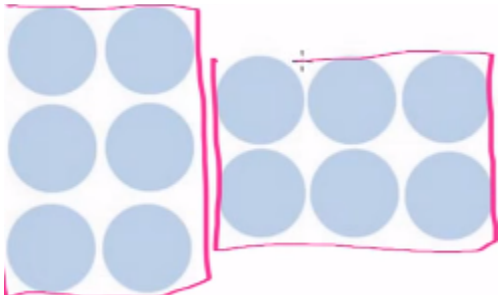
- **Gestalt Principles (i.e. Gestalt's Laws of Grouping):** Tries to explain how we perceive things the way we do.
    - Imagine watching a basketball game on TV. Why don't we tell ourselves that we're looking at bunch of still pictures rather influence ourselves that it's some fluid realistic representation of basketball game?
- **Similarity**: items similar to one another grouped together by brain. Ex: The brain automatically organizes these squares and circles in columns, and not in rows.



- **Pragnanz:** reality organized reduced to simplest form possible. Ex. Olympic rings, where the brain automatically organizes these into 5 circles, instead of more complex shapes.

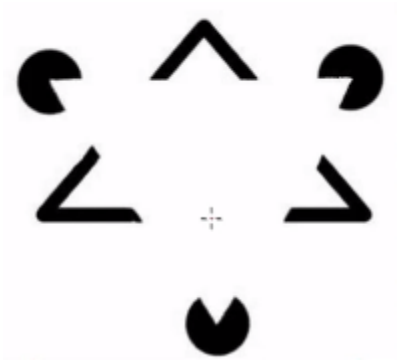


- **Proximity**: objects that are close are grouped together, we naturally group the closer things together rather than things that are farther apart. Ex: We group things close to one another together.



- **Continuity**: lines are seen as following the smoothest path. Ex: You group the line together!

- **Closure:** objects grouped together are seen as a whole. Mind fills in missing information. Ex. You fill in the triangle even though there is none.



- **Symmetry:** the mind perceives objects as being symmetrical and forming around a center point.

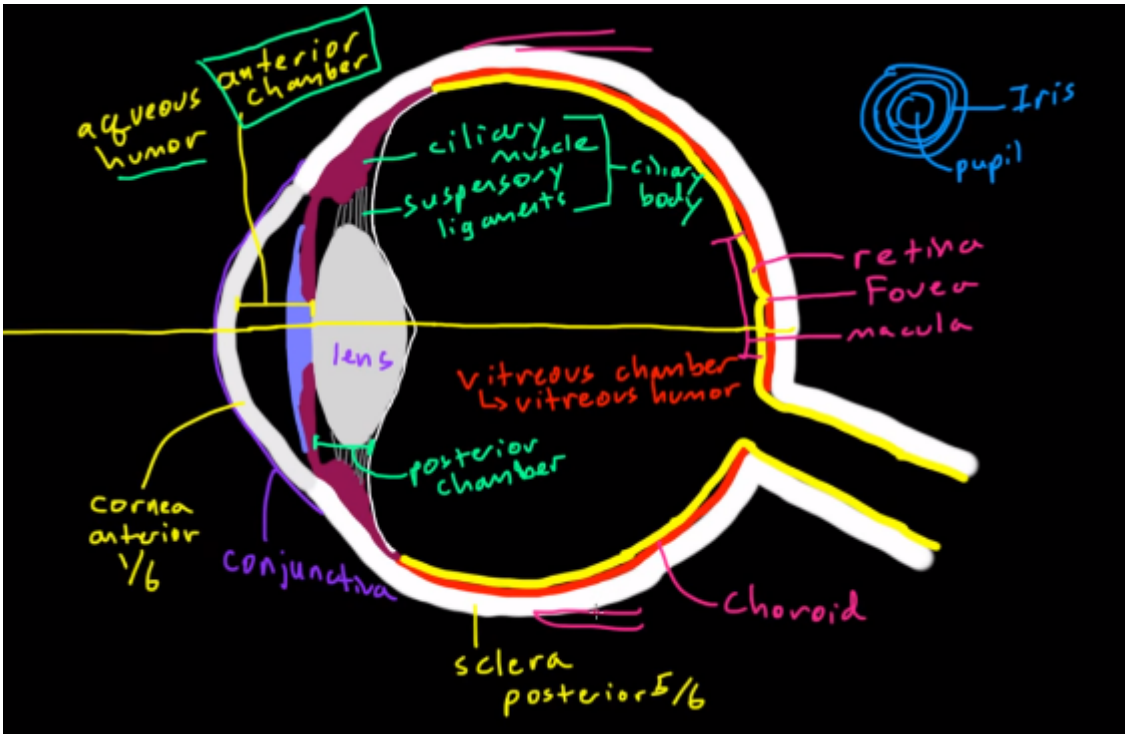
- **Law of Common Fate:** For example, if there are an array of dots and half the dots are moving upward while the other half are moving downward, we would perceive the upward moving dots and the downward moving dots as two distinct units.
- **Law of Past Experiences**: The law of past experience implies that under some circumstances visual stimuli are categorized according to past experience. If two objects tend to be observed within close proximity, or small temporal intervals, the objects are more likely to be perceived together. For example, the English language contains 26 letters that are grouped to form words using a set of rules. If an individual reads an English word they have never seen, they use the law of past experience to interpret the letters "L" and "I" as two letters beside each other, rather than using the law of closure to combine the letters and interpret the object as an uppercase U
- **Contextual Effects:** the context in which stimuli are presented and the processes of perceptual organization contribute to how people perceive those stimuli (and also that the context can establish the way in which stimuli are organized)

Sight (Vision)

Structure of the Eye

- **Conjunctiva:** thin layer of cells that lines the inside of your eyelids from the eye.
- **Cornea:** transparent thick sheet of fibrous tissue, anterior 1/6th; starts to bends light, first part of eye light hits.

- A**nterior chamber:** space filled with **aqueous humour**, which provides pressure to maintain shape of eyeball; allows nutrients and minerals to supply cells of cornea/iris.
- **Pupil:** the opening in the middle of the iris. The size of the pupil can get bigger/smaller based on the iris relaxing/contracting respectively. The pupil modulates the amount of light able to enter the eyeball.
- **Iris:** Gives the eye color. The muscle that constricts/relaxes to change the size of the pupil.
- **Lens:** bends the light so it goes to back of eyeball – focuses light specifically on the fovea of the retina. Adjust how much it bends the light by changing its shape, using the suspensory ligaments.
- **Suspensory ligaments**: attached to a **ciliary muscle**. These two things together form the **ciliary body**, what secrets the aqueous humor.
- **Posterior chamber**: area behind the iris to the back of lens; also filled with aqueous humor.
- **Vitreous chamber**: filled with **vitreous humour**, a jelly-like substance to provide pressure to eyeball and gives nutrients to inside of eyeball.
- **Retina:** inside, back area filled with photoreceptors, where the ray of light is converted from a physical waveform to a electrochemical impulse that the brain can interpret.
- **Macula**: special part of retina rich in **cones**, but there are also rods.
- **Fovea**: special part of macula. Completely covered in cones, ***no rods***.
  *Rest of the retina is covered in primarily rods.
- **Cones:** Detect color and discern high level of detail in what you are observing. Cone shaped.
- **Rods:** Detect light. Rod shaped.
- **Choroid** – pigmented black in humans, is a network of blood vessels that helps nourish the retina. It black all light is absorbed. Some animals have a different colored choroid which gives them better night vision.
- **Sclera** – Usually absorbs by the time the light gets to this. The whites of the eye, thick fibrous tissue that covers posterior $5/6^{th}$ of eyeball (cornea covers the anterior 1/6). Attachment point for muscles. Extra layer of protection and structure of eyeball. Lined with the conjunctiva.



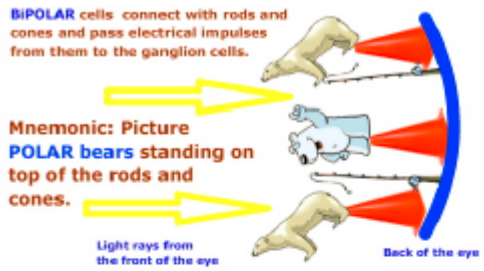
Visual Sensory Information

- **Transmission** is the electrical activation of one neuron by another neuron.
- **Perception** is conscious sensory experience of neural processing.
- **Processing** is the neural transformation of multiple neural signals into a perception.
- **Transduction** occurs whenever energy is transformed from one form to another; in this case, light energy is transformed to electrical energy by rods and cones.
- **Sensation** requires a physical stimulus to be converted into a neural impulse.
- In the case of the eye, light is being converted to a **neural impulse** by a **photoreceptor.**
- What is **light**?
    - Light is an electromagnetic wave.
    - Electromagnetic (EM) spectrum contains everything from gamma rays (low wavelength) to AM/FM waves (long wavelength). Visible light is in the middle of the EM spectrum.
        - Violet (400nm) – Red (700nm). Highest to lowest wavelength: ROYGBV
    - The Sun is one of most common sources of light
- Light enters pupil and goes to retina, which contains **rods** and **cones**
    - There are 120 million rods, for night vision
        - Light comes in, goes through pupil, and hits rod. Normally rod is turned **on**, but when light hits turns **off**.
        - When rod is **off**, it turns **on** a bipolar cell, which turns on a retinal ganglion cell, which goes into the optic nerve and enters the brain.
    - There are 6-7 million cones
        - 3 types: red, green, blue

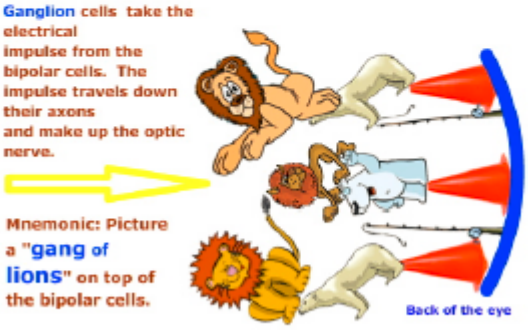
- Almost all cones are centered in fovea (details), which is the center of the macula.
    - Ex. Helps us search for Waldo.

- **Phototransduction cascade**: what happens when light hits rod/cone
    - Light hits rods (which causes rod turns off) → bipolar cell (turns on)→ retinal ganglion cell (turns on) → optic nerve → BRAIN.
    - The phototransduction cascade is the process of rod turning from ON → OFF

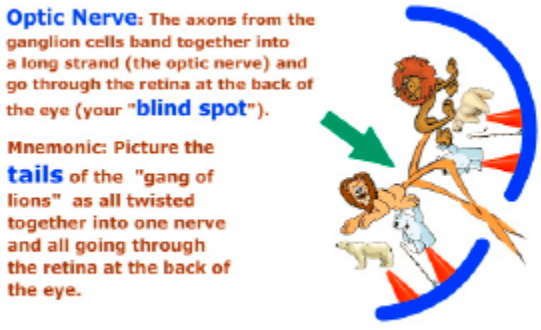
Bipolar Cells: are found in the retina. These cells send visual signals from the rods and cones to the ganglion cells. Imagine polar bears standing on top of the rods and cones.


BiPOLAR cells connect with rods and cones and pass electrical impulses from them to the ganglion cells.
Mnemonic: Picture POLAR bears standing on top of the rods and cones.
Light rays from the front of the eye
Back of the eye

Ganglion Cells: are found in the retina. The bipolar cells send signals to the ganglion cells. Imagine a "gang of lions" standing on top of the polar bears.


Ganglion cells take the electrical impulse from the bipolar cells. The impulse travels down their axons and make up the optic nerve.
Mnemonic: Picture a "gang of lions" on top of the bipolar cells.
Back of the eye

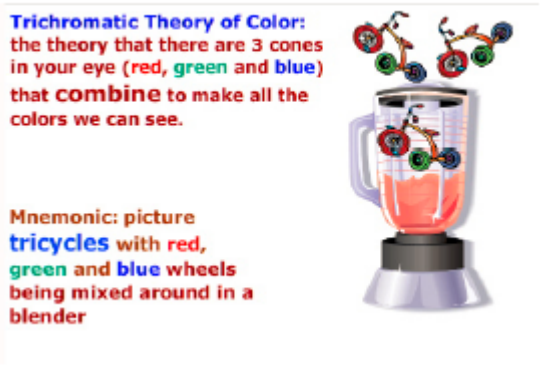
Optic Nerve: visual signals, after having been picked up by the rods and cones and transferred to bipolar cells to the ganglion cells, finally leave the eye through the optic nerve, which is really just the axons of the ganglion cells. Imagine that the tails of the "gang of lions" are the axons that make up the optic nerve and exit out the back of the eye.

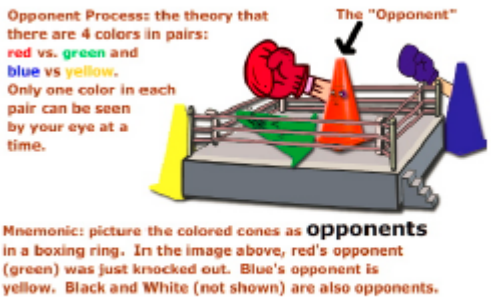

Optic Nerve: The axons from the ganglion cells band together into a long strand (the optic nerve) and go through the retina at the back of the eye (your "blind spot").
Mnemonic: Picture the tails of the "gang of lions" as all twisted together into one nerve and all going through the retina at the back of the eye.

Trichromatic Theory of Color Vision. This theory states that you have cones that are receptive to 3 colors: red, green and blue. These three colors are mixed together and you perceive color.

The only problem with this theory is that while our eyes can mix together, say red and yellow to make orange, we can't seem to mix red and green or blue and yellow. To explain this, we have another theory….

Opponent Process Theory of Color Vision. This theory states that you have cones that perceive 4 colors: red, green, blue and YELLOW and that red and green cones oppose each other, as do blue and yellow cones. Black and white sensitive cones are also opponents. Between these opponents, only one color can dominate at a time.


Trichromatic Theory of Color: the theory that there are 3 cones in your eye (red, green and blue) that combine to make all the colors we can see.
Mnemonic: picture tricycles with red, green and blue wheels being mixed around in a blender

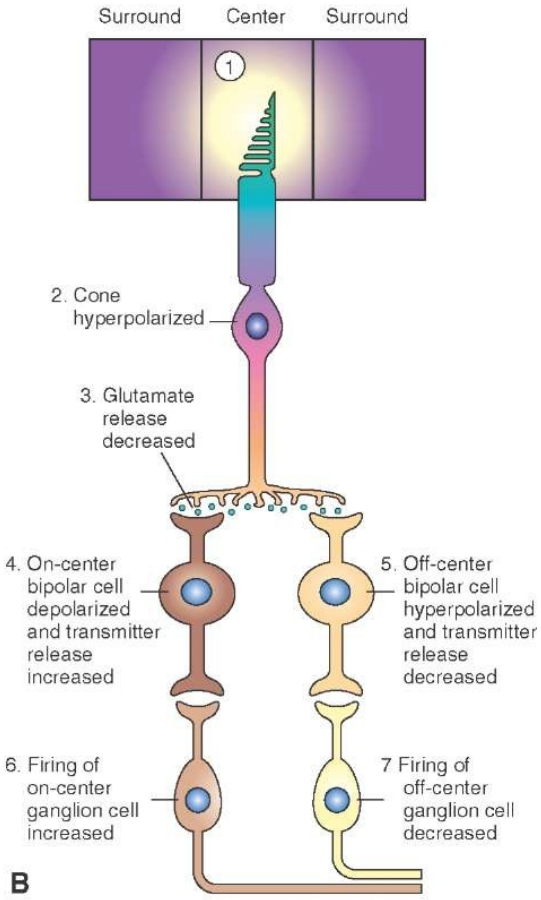

Opponent Process: the theory that there are 4 colors in pairs: red vs. green and blue vs yellow. Only one color in each pair can be seen by your eye at a time.
The "Opponent"
Mnemonic: picture the colored cones as opponents in a boxing ring. In the image above, red's opponent (green) was just knocked out. Blue's opponent is yellow. Black and White (not shown) are also opponents.

The Phototransduction Cascade

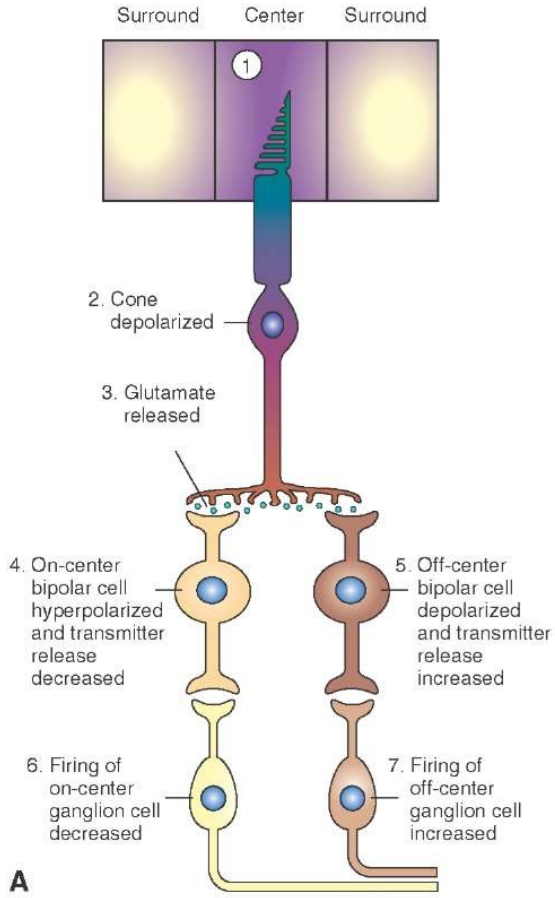
1. **The Phototransduction Cascade** (PTC) - makes the brain recognize that there is light entering the eyeball. The process of making the light → neural impulse by turning off a rod. The neural impulse can turn on other cells and eventually be processed by the brain.

- Retina is made off a bunch of different cells – rods and cones.
- As soon as light is presented to a rod, it takes light and converts it to a neural impulse. Normally on, but when light hits it, the rod turns off.
- PTC is set of steps that turn it off.
    - Inside rod are a lot of **optic disks** stacked on top of one another.
    - A lot of proteins on the disks. One is **rhodopsin** (on a cone the same protein is called a **photopsin**), a multimeric protein with 7 discs, which contains a small molecule called **retinal (11-cis retinal)**. When light hit, comes through pupil and hit the retinal, then it rods, some of the light hits rhodopsin (which contains the retina) and causes the retinal to change conformation from bent to straight conformation **(11-trans retinal)**.
    - When retinal changes shape, rhodopsin changes shape (closely linked molecules). This begins the cascade.
    - Next, there's a molecule called **transducin** made of 3 different parts **– alpha, beta, gamma** that is attached to the rhodopsin typically.

- When the rhodopsin changes shape, transducin breaks from rhodopsin, and **alpha** subunit binds to another disk protein called **phosphodiesterase (PDE)**.
- PDE takes **cGMP** and converts it to regular GMP. [So when light hits, lower concentration of cGMP and increases concentration of GMP].
- Lots of **Na+ channels** on the rods allow **Na+ ions to come in**,
    - **cGMP bound to Na+ channel, keeps the channel open** and hence "ON", as cGMP concentration decreases (due to the PDE which converts it into GMP), Na+ channel closes and cell turns "OFF"
    - When Na+ channels become unbound of cGMP, less Na+ enters the cell, then **cell hyperpolarization** and turn "OFF"
- Next, bipolar cells (two variants: ON CENTER and OFF CENTER).
    - When light hits ROD, turned off → **ON CENTER** bipolar cells active, **OFF CENTER** bipolar cells inactive.
    - When **ON CENTER** bipolar cells turned on, this activates **ON CENTER retinal ganglion cell,** which sends signal to **optic nerve** to brain.


Surround
Center
Surround
1
2. Cone hyperpolarized
3. Glutamate release decreased
4. On-center bipolar cell depolarized and transmitter release increased
5. Off-center bipolar cell hyperpolarized and transmitter release decreased
6. Firing of on-center ganglion cell increased
7 Firing of off-center ganglion cell decreased
B

- When dark, ROD turned on → **ON CENTER** bipolar cells inactive, **OFF CENTER** bipolar cells active.
- When **OFF CENTER** bipolar cells turned on, this activates **OFF CENTER retinal ganglion cell,** which sends signal to **optic nerve** to brain.

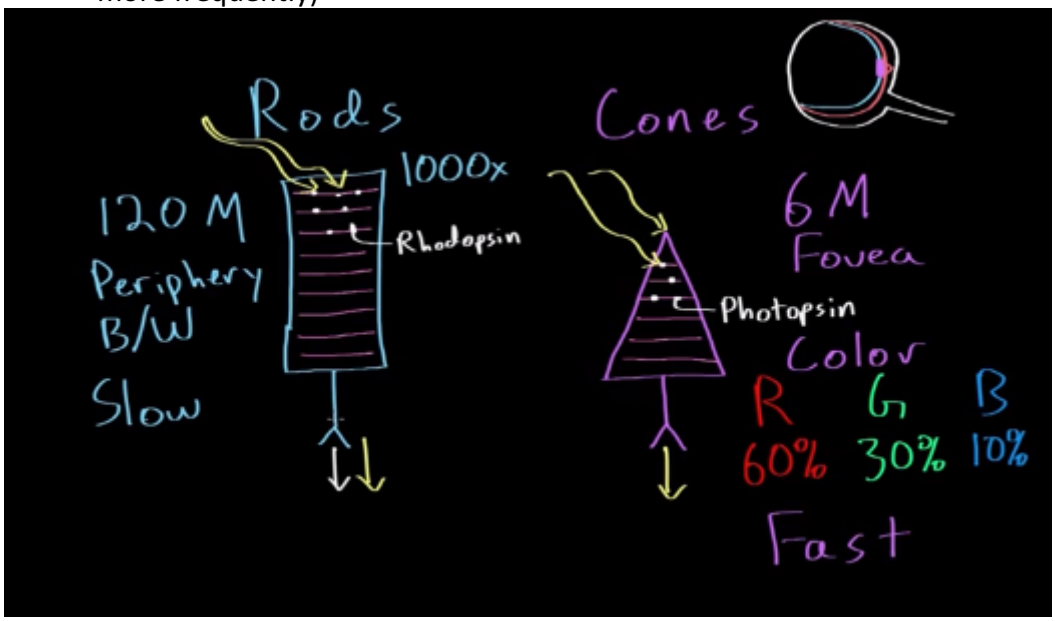


- **Photopic vision** occurs at levels of **high light** levels.
- **Mesopic vision** occurs at **dawn or dusk** and involves both rods and cones.
- **Scotopic vision** occurs at levels of **very low** light.

Photoreceptors (Rods and Cones)

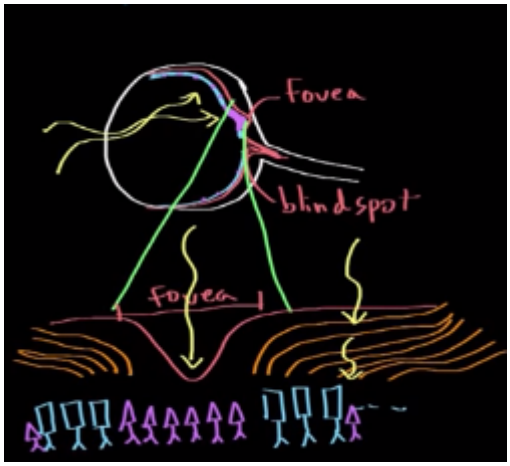
- A photoreceptor is a **specialized nerve** that can take light and convert to neural impulse.
- Inside rods are **optic discs**, which are large membrane bound structures – thousands of them. In membrane of each optic disc are proteins that fire APs to the brain.
- Cones are also specialized nerves with same internal structure as rod.
- Rods contain **rhodopsin**; cones have similar protein **photopsin**.
- If light hits a **rhodopsin**, will trigger the phototransduction cascade. Same process happens in a cone.
- Differences between rods and cones:

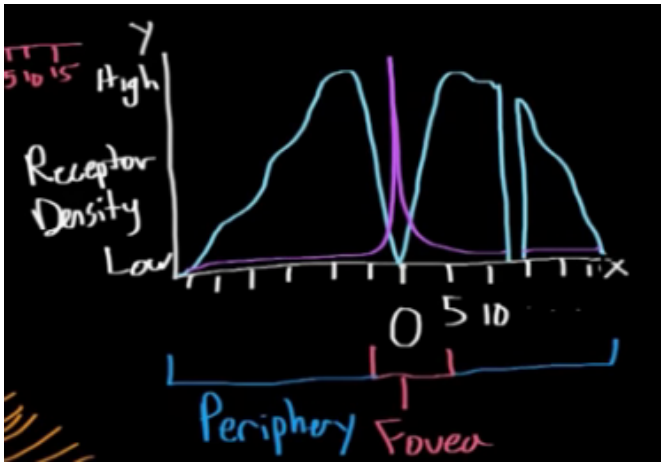
- **MORE RODS THAN CONES** (each eye has 120M rods vs. 6M cones or 20x more rods than cones.) More important to see light than detail initially!
- Cones are concentrated in the fovea.
- Rods are 1000x more sensitive to light than cones. Better at detecting light – telling us whether light is present i.e. black/white vision.
- Cones detect **color** primarily but also some light (three types : 60% Red, 30% Green, 10% Blue)
- **Rods** have **slow** recovery time vs. **cones** have **fast** recovery time. Takes a while to adjust to dark – rods need to be reactivated. Cones adapt to change quickly (fire more frequently)



Photoreceptor Distribution in Retina

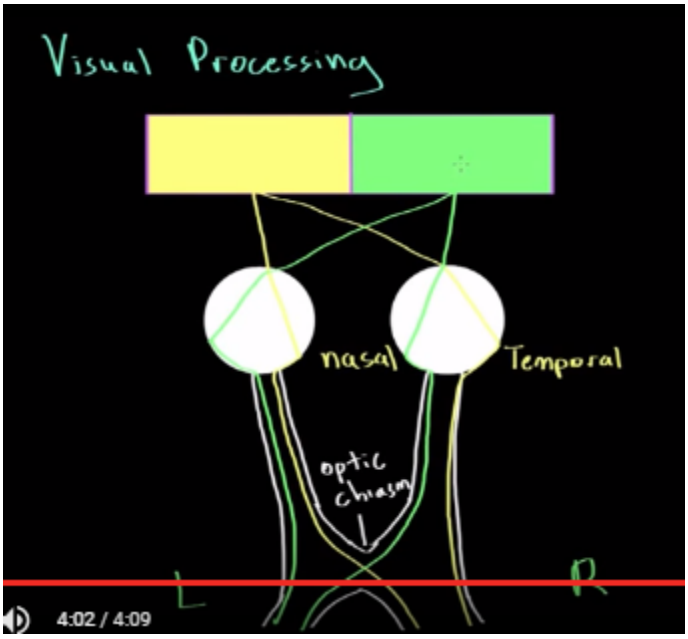
- Where optic nerve connects to retina, **blind spot** – no cones or rods.
- Rods are found mostly in periphery.
- Cones are found primarily in the fovea, and few dispersed through the rest of eye.
- At the fovea (dimple in retina) - there no axons in way of light so get higher resolution. At the periphery - light has to go through bundle of axons and some energy lost. So at fovea light hits cones directly. At the periphery, less light gets to the rods.





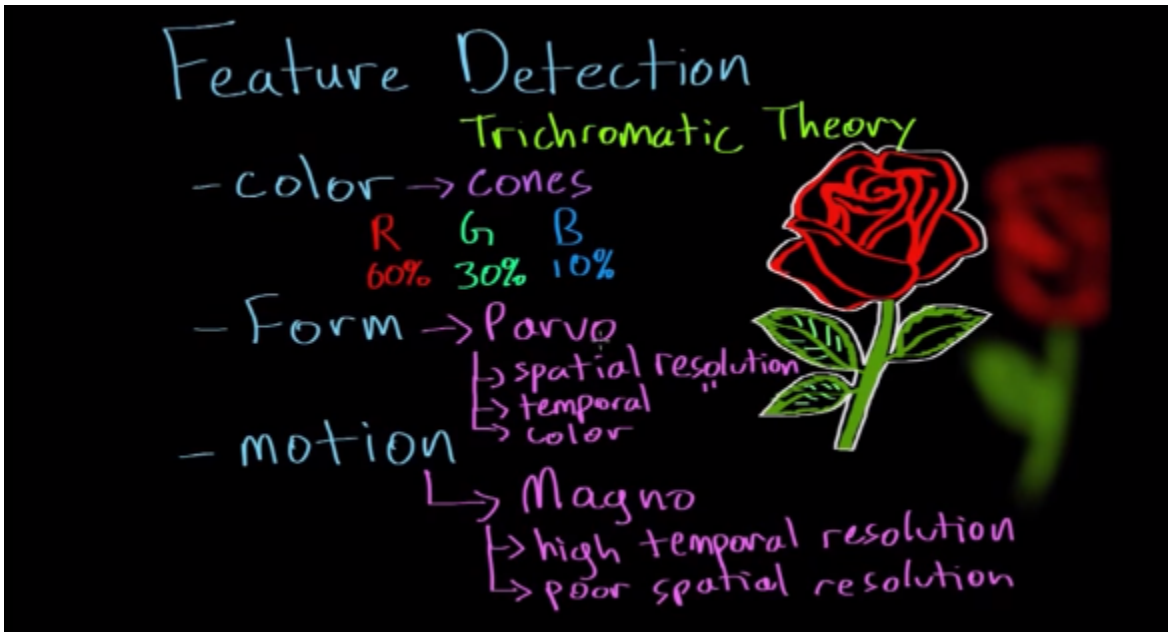
Visual Field Processing

- How our brain makes sense of what we're looking at. Right side of body controlled by left side, vice versa. How does it work in vision?
- All right visual field goes to left side of brain; all left visual field goes to right side of brain.
- Ray of light from the left visual field hits the NASAL side of the left eye and hits the TEMPORAL side of the right eye
    - Vice Versa for light from the right visual field. Ray of light from the right visual field hits the NASAL side of the right eye and hits the TEMPORAL side of the left eye
- **Optic nerves** from each eye networks the electrical signal to the brain and converge from each eye at the **optic chiasm** and then break off and dig deeper into the brain
    - Now….all light from the nasal side of both eyes cross to the other side so left nasal info goes to the right side and vice versa.
    - On the other hand, all axons leading from the temporal side DO NOT CROSS the optic chiasm.
    - What it effectively does, is the right visual field goes to the left brain and the left visual field goes to the right side of the brain



Feature Detection and Parallel Processing

- **Feature Detection**: When looking at an object, you need to break it down into its component features to make sense of what you are looking at. There are 3 things to consider when looking at any object: **color**, **form**, and **motion**.
    - **Color:**
        - Cones
        - **Trichromatic theory** of color vision, three types of cones.
            - RED (60%), GREEN (30%), BLUE (10%).
            - Remember, red objects reflect red, green objects reflect green, and blue objects reflect blue.
        - If object reflects red → red light hits red cone → fire axon potential → brain is like OH RED!!),
    - **Form:** We need to figure out boundaries of the object and shape of the object.
        - **Parvocellular pathway**: good at spatial resolution (**boundaries** and **shape**—high levels of **details**), and **color**. But poor temporal (can't detect motion—only stationary.)
        - Cones responsible
        - Acronym: **P**ink **P**yramid (a type of "form"/"shape") = **P**arvocellular pathway
    - **Motion:**
        - **Magnocellular pathway**: has high temporal resolution (think time, motion) resolution [encodes motion]. But has poor spatial resolution; no color). Rods responsible.
        - Acronym: **M**otion = **M**agnocellular pathway
- **Parallel Processing**: detect/focus all information (color, form, motion) at same time.



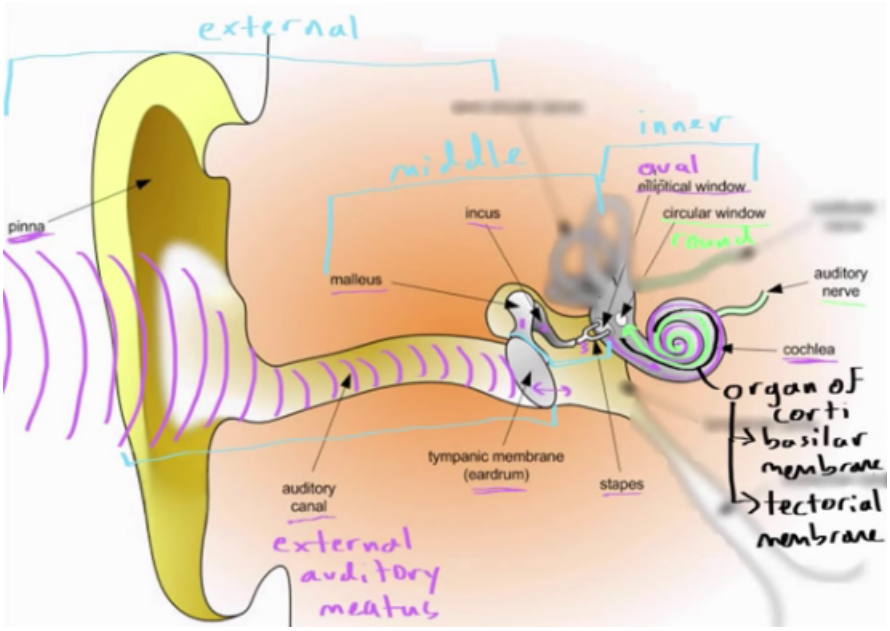
Sound (Audition)

Auditory Structure – Part 1

- **Audition**: our sense of sound.
- For us to hear sound we need two things (for audition to occur):
    1. **pressurized sound wave** (a stimuli)
    2. **hair cell** (a receptor, located in the cochlea)
- What is a pressurized sound wave? Ex. In between your hands are a bunch of air molecules, and when hands move towards each other, there is less space so the molecules compress and there is a higher pressure. The air molecules are becoming pressurized. .
- Air molecules are pressurized and try to escape, creating areas of high and low pressure – known as **sound waves**
    - Sound waves can be far apart or close together
    - **Wavelength:** how close peaks are**.**
        - Smaller wavelength = greater frequency.
        - Higher wavelength (smaller frequency) = travel farther = penetrate deeper into the cochlea.
    - Different noises have different sounds
    - You can listen to different frequencies at same time – if you add diff frequency waves together, get weird frequency. Ear has to break this up. Able to do that because sound waves travel different lengths along cochlea.
- Sound (auditory waves) path:

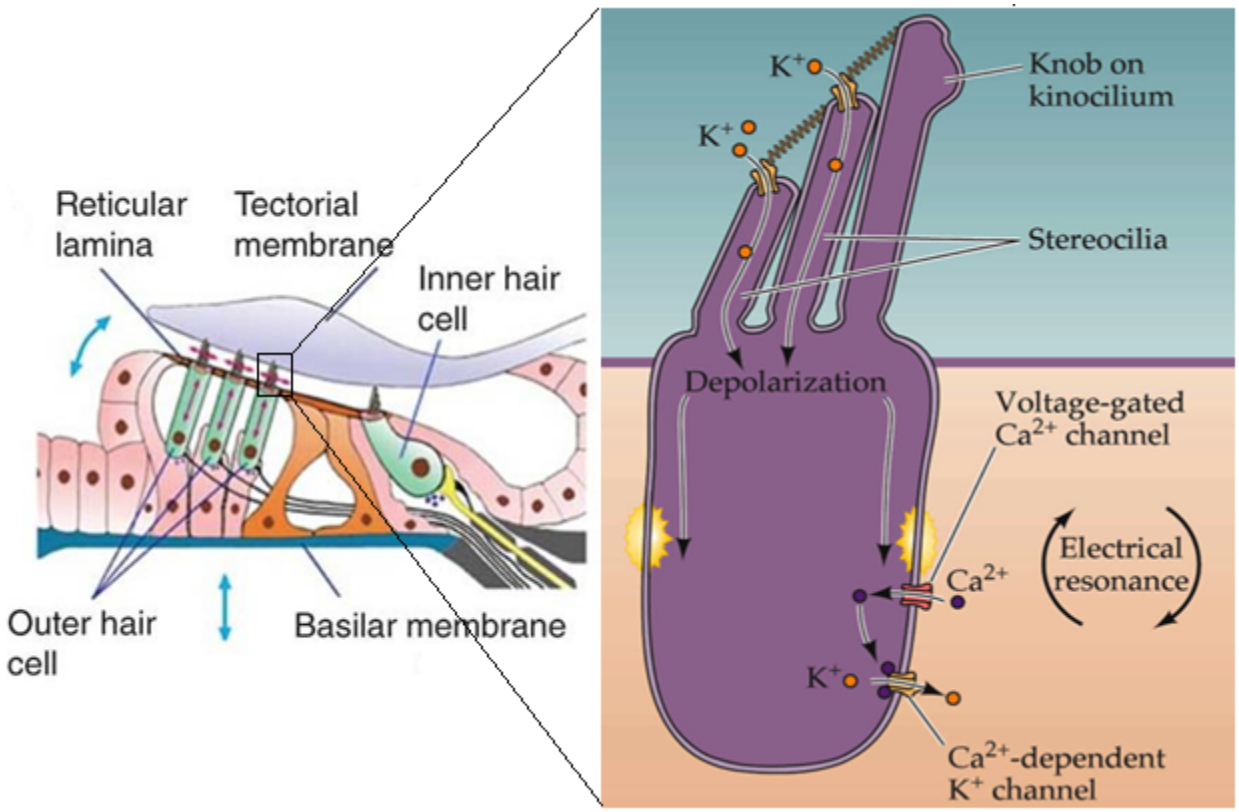
1. First hit outer part of ear, known as the **pinna**.
2. Then the sound gets funneled from the pinna to **the auditory canal** (also known as **external auditory meatus).**
3. Then from the auditory canal they hit the **tympanic membrane** (also called the **eardrum**).
4. As pressurized wave hits eardrum, it vibrates back and forth, causing 3 bones to vibrate in this order:
    i. **malleus (hammer)**
    ii. **incus (anvil)**
    iii. **stapes (stirrup)**
        ***[acronym: MIS]
        ***Three smallest bones in the body.
        ***These bones combined are also referred to as the **ossicles**.
5. Stapes is attached to **oval window** (aka **elliptical window**). The oval window then vibrates back and forth.
6. As it gets vibrated, it pushes fluid and causes it to go in/around **cochlea** (a round structure lined with hair cells).
7. At tip of cochlea (inner most part of circle), where can the fluid now go? It can only go back, but goes back to the **round window (circular window)** and pushes it out.
8. The reason doesn't go back to oval window, is because in middle of cochlea is a membrane – the **organ of Corti** (includes the **basilar membrane** and the **tectorial membrane**).
9. As **hair cells (cilia)** move back and forth in the cochlea – electric impulse is transported by **auditory nerve** to the brain.
    - **Place theory** is a theory of hearing which states that our perception of sound depends on where each component frequency produces vibrations along the basilar membrane. By this theory, the pitch of a musical tone is determined by the places where the membrane vibrates, based on frequencies corresponding to the tonotopic organization of the primary auditory neurons. Place theory posits that one is able to hear different pitches because different sound waves trigger activity at different places along the cochlea's basilar membrane.
10. The above process of fluid going around the cochlea keeps occurring till the energy of the sound wave dissipates and stops moving. Occurs more = more hair cells vibrate.

- General classification of the ear
    - **External/Outer ear:** from pinna to tympanic membrane
    - **Middle ear**: From malleus to stapes (three ossicles)
    - **Inner ear**: Cochlea and semicircular canals



Auditory Structure – Part 2

- Focus on cochlea and inner ear
- Let's unroll the cochlea. Stapes – moving back and forth at same frequency as stimulus. It pushes the elliptical window back and forth.
    - There's fluid inside the cochlea, which gets pushed around cochlea, and comes back around**. Organ of Corti** splits cochlea into 2 – the upper and lower membrane.
- Cross section of Organ of Corti
    - **Upper and lower membranes**, and little hair cells. As fluid flows around the organ, it causes hair cells to move back and forth.
    - At the upper membrane: The hair cells/cilia are called the **hair bundle** and it is made of little filaments. Each filament is called a **kinocilium**. Tip of each kinocilium is connected by a **tip link** which is attached to gate of **K+ channel**. When the tip links get pushed back and forth by endolymph movement, they stretch and allows K+ to flow inside the cell from the endolymph (which is K+ rich)
    - Ca^{2+} cells get activated when K^{+} is inside, so Ca^{2+} also flows into the cell, and causes an AP, which then activates a **spiral ganglion cell**, which then activates the **auditory nerve.**

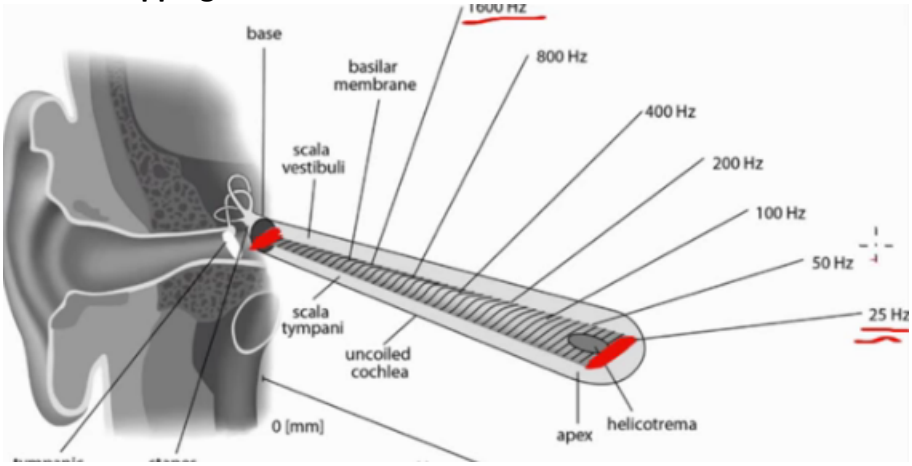


Auditory Processing

- Brain relies on **cochlea** to differentiate between 2 different sounds.
    - Base drum has low frequency, whereas bees have high frequency.
    - We can hear frequencies between 20-20000Hz.
    - The information from the base drum and bees hits the cochlea. How the information how sound wave converts into a neural signal then to the brain was discussed in the previous section.
    - **Auditory Processing**: How does the cochlea distinguish between sounds of varying frequencies and how is this distension maintained by the brain?
    - Brain uses **basilar tuning –** there are varying hair cells in cochlea and allows brain to distinguish between high and low frequency sounds. Hair cells at base (start of cochlea) of cochlea are activated by high frequency sounds, and those at apex (end of cochlea) by low frequency sounds. THNK: long wavelengths can travel farther.
        - As sounds of different frequencies reach the ear, they will stimulate different parts of the basilar membrane.
        - Apex = 25 Hz (low freq, HIGH wavelength)
        - Base = 1600 Hz (high freq, LOW wavelength)
        - As sound enters the cochlea, it travels and activates the hair cell that matches its frequency and it is mapped to a particular part of the brain. The **primary auditory cortex** (part of temporal lobe…acronym: hear **T**ime

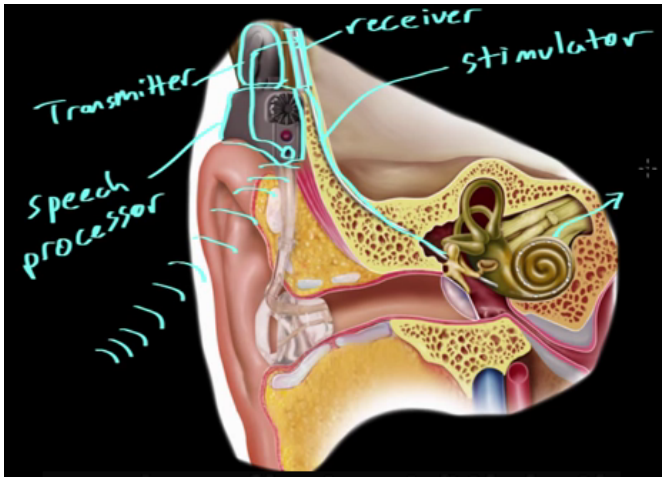
Ticking = **T**emporal Lobe**)** receives all info from cochlea. It is separated by regions which detect different frequencies (0.5 kHz – 16 kHz).

- If this didn't occur, brain wouldn't be able to distinguish between different sound frequencies.
- So with basilar tuning, brain can distinguish diff frequencies – **tonotopical mapping**.



Cochlear Implants

- **Cochlear Implants**: A surgical procedure that attempts to restore some degree of hearing to individuals with **sensorineural narrow hearing loss** – aka **`nerve deafness`**
  - Individuals who have a problem with conduction of sound waves from cochlea to brain.
  - **Receiver** goes to a **stimulator**, which reaches the cochlea. Receiver receives info from a **transmitter**. Transmitter gets electrical info from the **speech processor**. Speech processor gets info from microphone.
  - Sound -> microphone -> transmitter (outside the skull) sends info to the receiver (inside skull). Then it sends info to the stimulator, into the cochlea, and cochlea converts electrical impulse into neural impulse that goes to brain. Restores some degree of hearing.



Somatosensation

xSomatosensation

See Notes above

Sensory Adaptation and Amplification

- **Sensory Adaptation** is change over time of receptor to a constant stimulus – **down regulation** of a sensory receptor in the body
    - Ex. As you push down with hand, receptors experience constant pressure. But after few seconds receptors no longer fire.
    - Important because if cell is overexcited cell can die. Ex. If too much pain signal in pain receptor (capsaicin), cell can die.
    - Ex; light pressure receptor in your hand. They fire constantly, but over time they adapt and stop firing if there is no change in stimuli. Information does not get sent to the brain if there is no change in stimuli.
- **Amplification** is **up regulation.** Opposite of sensory adaptation.
    - Ex. Light hits photoreceptor in eye and can cause cell to fire. When cell fires AP, can be connected to 2 cells, which also fire AP and so on. By the time gets to the brain, it is amplified.

Somatosensory Homunculus

- **Somatosensory Homunculus:** A map of your body in your brain. Information all comes to the **"sensory strip"**. It is a topological map of the entire body in the cortex. Different areas of the body have signals that go to different parts on this strip.
- This part of cortex/parietal lobe is called the **sensory cortex** – contains the homunculus.
- Info from body all ends up in this somatosensory cortex of the parietal lobe.
- Brain has information that comes from various different parts of the body.
- If there was a brain tumor, to figure out what part it's in neurosurgeons can touch diff parts of cortex and stimulate them. If surgeon touches part of cortex patients can say they feel it. Do it to make sure they aren't removing parts in sensation, which would make patients loose sensation in those areas.

Proprioception and Kinaesthesia

- How can you walk in a pitch-black room? You rely on your sense of balance/position – **proprioception**.
    - Tiny little receptor/sensor (known as a **spindle)** located in our muscles sends signals that go up to spinal cord and to the brain. Spindle has a protein that is sensitive to stretching.
    - Sensors contract with muscles – so we're able to tell how contracted or relaxed every muscle in our body is.
    - *Cognitive* awareness of your body in space. Subconscious. Not always thinking about it.
- **Kinaesthesia** is talking about movement of the body. Kinaesthesia is more *behavioural*.
    - You teach yourself how to move to successfully complete the task at hand.
    - Ex: "If I move in this direction, I will hit the baseball."

- Recap: Not the same, but share a lot in common – both help tell you where your body is in space.
    - Proprioception includes sense of balance/position, while kinesthesia includes sense of movement. (acronym Kinetics/similar to kinesthesia = movement)
    - Proprioception is cognitive, kinesthesia is behavioral

Pain and Temperature

- Ability to sense Pain = **nociception.**
- Ability to sense temperature = **thermoception**
- Both temperature and nociception are SLOW
- In order for us to sense temperature, we rely on the **TrypV1 receptor**.
    - Interestingly, this receptor is also sensitive to *pain*.
    - There are thousands of these in membranes. Heat causes a **conformational change** (change in physical structure) in the protein.
    - When cell is poked, thousands of cells are broken up, and releases different molecules that bind to TrypV1 receptor. Causes change in conformational change, which activates the cell and sends signal to brain.
- **3 types of nerve fibres** – fast, medium, slow. [Acronym: fast to slowest alphabetically A-B, A-D, C]
    - **A-beta fibres -** Fast ones are thick and covered in myelin (less resistance, high conductance)
    - **A-delta fibres** -– smaller diameter, less myelin.
    - **C fibres** - small diameter, unmyelinated (lingering sense of pain).
- Pain also changes conformation of receptors – capsaicin binds the TrypV1 receptor in your tongue, and triggers the same response.
- The sensory component would describe aspects of the intensity of pain.
- Affective refers to the experience of emotions
- **Gate control theory of olfaction is a theory of the processes of nociception.** The **gate control theory** of pain asserts that non-painful input closes the "**gates**" to painful input, which prevents pain sensation from traveling to the central nervous system. Therefore, stimulation by non-noxious input is able to suppress pain. “Fast blocks slow” Ronald Melzack and Patrick Wall.

Taste (Gustation) and Smell (Olfaction)

Pheromones

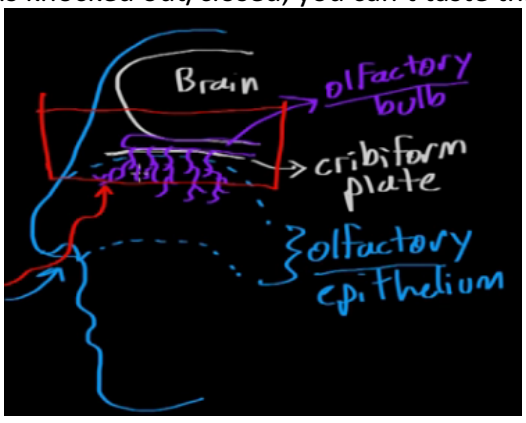
- Why do dogs pee on fire hydrant? There are molecules released in the urine, which can be sensed by other animals through the nose – **pheromones**.
    - They’re specialized olfactory cells.
    - Cause some sort of response in animal smelling them.

- Pheromone is a chemical signal released by 1 member of the species and sensed by another species to trigger an **innate response**.
- Really important in animals, particularly insects – linked to mating, fighting, and communication.

- Specialized part of **olfactory epithelium in** animals – the **accessory olfactory epithelium**. It sends projections to the **accessory olfactory bulb** which then sends signals to the brain.
  - Within the accessory olfactory epithelium, you have a structure called the **vomeronasal system.**
  - In vomeronasal system, there are **basal cells** and **apical cells**. They have receptors at tips.
  - Molecule will come in and activate receptor on basal cell/apical cell here. Basal cell sends axon through accessory **olfactory bulb** to **glomerulus**, then **mitral or tufted cell** which eventually goes to the **amygdala** (part of the brain)
  - **Amygdala** is involved with emotion, aggression, mating etc. In temporal lobe, also involved in memory/decision making, emotional reactions
  - Signal transduction is where signal binds to receptor, which binds to GPCR. Depolarization. Signal goes to brain.
  - In humans have vomeronasal organ, but no accessory olfactory bulb. As a result, we rely very little on pheromones.

Olfaction – Structure and Function

- When you have a cold, you aren't able to taste things very well.
  - ex. When you eat, molecules travel up back of throat and some go into back of your nose. So you're using your sense of smell in conjunction with taste.
  - If your smell is knocked out/closed, you can't taste things as well.



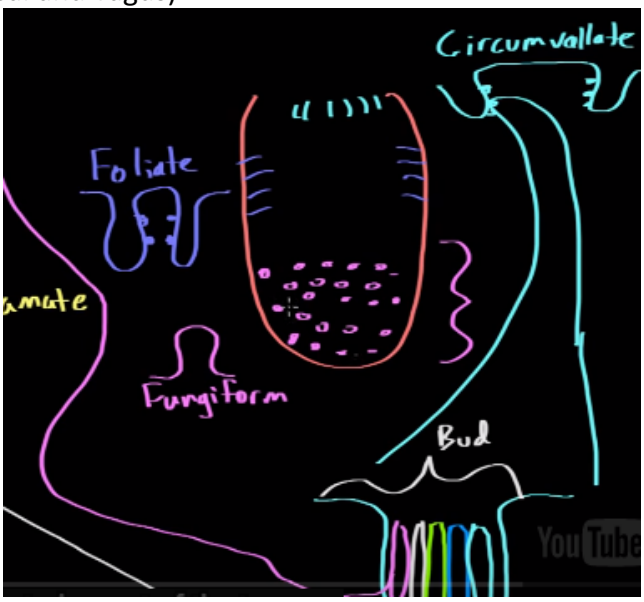
- Smell is also known as **olfaction**
- Area in nostril called the **olfactory epithelium** (olfactory sensory cells). Separating the olfactory epithelium from the brain is the **cribriform plate** (bone with little holes that allow olfactory sensory to send projections to the brain). Above the cribriform plate is

an extension from the brain – **olfactory bulb** – a bundle of nerves that sends little projections through cribriform plate into the olfactory epithelium, which branch off.
    - At end of each connection are receptors, each sensitive to 1 type of molecule.
    - Molecule travels into nose, binds one of receptors on nerve endings.
- Zoom in on olfactory bulb
    - Imagine there's olfactory cell sending projection to olfactory bulb. There are thousands of types of olfactory epithelial cells, each with diff receptor. These olfactory epithelial cells are located within the other epithelial cells. One, let's say is sensitive to (has a receptor for) benzene rings.
    - When it binds to receptor, triggers cascade of events that cause cell to fire. AP will end up in olfactory bulb. All cells sensitive to benzene will fire to one olfactory bulb – called a **glomerulus** – designation point for various sensory olfactory cells that are sensitive to the same molecule. For example, a benzene glomerulus.
    - At the glomerulus, the receptors then synapse on another cell known as a **mitral/tufted cell** that project to the brain. This organization is there because it's easier for one cell to send a projection to the brain instead of thousands.
- How does a molecule bind to a receptor and cause an AP? The molecule binds to the GPCR receptor on odor molecule → GPCR on olfactory epithelia → G-protein dissociates and causes a cascade of events inside the cell → G protein binds to ion channel which allows cells outside the cell to come inside→ opens and triggers an AP → goes to cribriform plate → glomerulus → activate mitral/tufted cell → synapse to brain.
- Idea: 100 of different olfactory epithelial each sensitive to one particular molecule. They all send projections to one glomerulus respective to their specialization. Then they synapse onto a mitral/tufted cell which signals to the brain.
- Smell (olfaction) and taste (gustation) doesn't synapse on to thalamus and hence are both ipsilateral while vision/hearing/touch are contralateral.
- The **labeled-line** theory of olfaction describes a scenario where each receptor would respond to specific stimuli and is directly linked to the brain.
- The **vibrational theory** of olfaction asserts that the vibrational frequency of a molecule gives that molecule its specific odor profile.
- **Steric theory** of olfaction, or **shape theory**, asserts that odors fit into receptors similar to a lock-and-key.
- **Anosmia** – inability to perceive order. (Acronym: aNOSEmia = Smell)
- The pathway for olfaction goes from the olfactory bulb to the amygdala and the piriform cortex. From there the signal is transmitted to the orbitofrontal cortex.

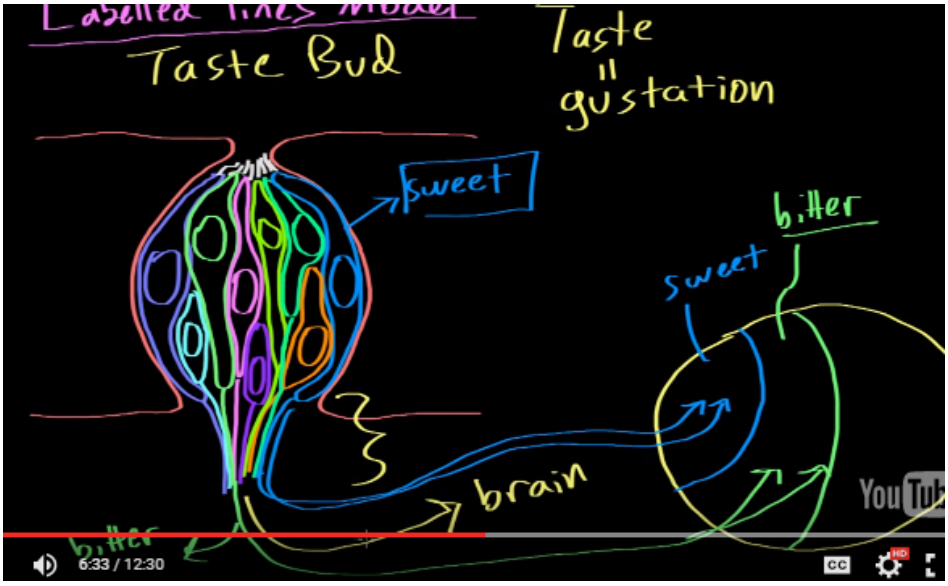
Gustation – Structure and Function

- We have 5 main tastes, each taste depends on a specific receptor that is localized on the tongue – **bitter, salty, sweet, sour, and umami** (ability to taste glutamate).
- The gustatory system consists of taste receptor cells in taste buds. Taste buds, in turn, are contained in structures called papillae.

- Taste buds are concentrated anteriorly (front) on the tongue. Taste buds can be **fungiform** (anterior), **foliate** (side), and **circumvallate** (back).
    - In **each taste bud are the 5-receptor cells** that can detect each taste. Each taste can be detected anywhere on the tongue. Each taste bud has cells specialized for each of the 5 tastes.
    - Mostly on anterior part of tongue.
- Fungiform papillae are mushroom-shaped structures located on the tip and sides of the tongue, which contain taste buds.
- Foliate papillae are folded structures at the back of the tongue on both sides, which contain taste buds.
- Circumvallate papillae are flat mound structures that are found at the back of the tongue and contain taste buds.
- **Filiform papillae** do not contain taste buds and exist all over the tongue. The center of the tongue contains only filiform papillae. This is why stimulation of the center of the tongue does not cause a taste sensation, while the back and perimeter produce a broad range of taste sensations.
- Tastant – a substance that stimulates the sense of taste
- Gustducin – a protein associated with the sensation of taste
- Front 2/3rd carries signals via 7th cranial nerve via the chorda tympani
- Posterior (Rear 1/3rd) carries signals via the 9th and 10th cranial nerves (glossopharyngeal and vagus)



- **Labelled lines model** - Each taste bud receptor has 5 axons, all which send separate taste information to different parts of the **gustatory (taste) cortex**. Remain separate to the brain. And they all synapse on diff parts of the **gustatory (taste) cortex**.



- Ex. Glucose hits tongue →activates sweet cell (because it has sweet sensitive receptors), triggers cascade of events so cell depolarizes, and travels down axon to the brain.
- Glucose binds GPCR, conformational change, G-protein dissociates, opens ion channels, cause cell to depolarize and fire an AP

- Sweet, umami, and bitter cells rely on **GPCR** receptors.
- Sour and salty rely on **ion channels**. (Acronym: **SO**dium, which is an ion channel is **SO**ur and **salty**, think salt.) They bind to receptor directly, ex. NaCl binds to receptor and causes ion channel to open, and + ions outside flow in. Cell depolarizes and fires an AP.
  - Salty tastants bind to salt receptors which detect the presence of sodium ions and should not be chosen by the researchers.
  - Sour tastants bind to sourness receptors that react with hydrogen cations (H+). Once H+ binds to the receptor, it closes potassium channels.
- What happens if we put salty receptor inside a sweet cell? Receptors in membrane bind to glucose. But let's insert a salty receptor. Since axon from cell leads to brain, if NaCl comes in, it activates the receptor, + ions go inside, sweet cell depolarizes and fires AP, and brain interprets it as a sweet signal. Put a salty receptor in a sweet cell, can trick your brain into thinking salt is sugar!
- Taste/Smell - Do not synapse on the thalamus. Oribofrontal cortex is first place of integration.

Sleep and Consciousness

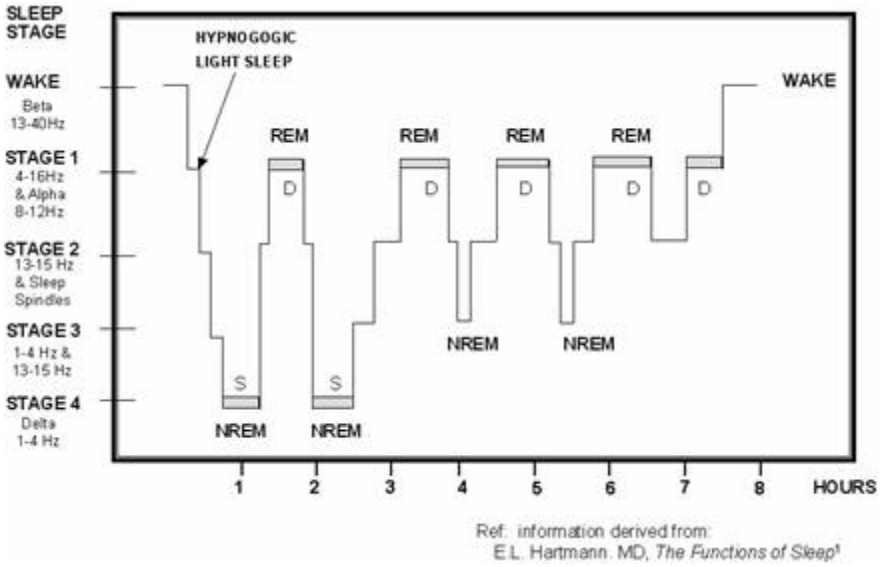
States of Consciousness

- **Consciousness** is awareness of our self and environment. Can have different levels of consciousness (diff levels of awareness) and can be natural or be induced by external factors such as drugs or internal such as mental efforts. States range from alertness to sleep.
- **Alertness** – you're awake, aware of who you are, what's going on in the environment, focus your attention, engage in conformation, code info to your memory.
- **Daydreaming**- feel more relaxed, not as focussed as alertness. Can also be light meditation (self-induced)
- **Drowsiness -** just before falling asleep/after waking up. Can also be self-induced in deep meditation.
- **Sleep** – not aware of self or world around you.
- **Electroencephalograms (EEGs)** can measure brainwaves.
    - 4 main types: **alpha, beta, delta, theta**
    - Each type oscillates at diff frequency and associated with different type of consciousness.
        - **Beta** (12-30Hz) – associated with **awake/concentration**. If you are alert for too long, beta levels get high and you experience increased stress, anxiety, restlessness- constant awakened alertness.
        - **Alpha** (8-13 Hz) – in **daydreaming** state. Lower frequency than beta waves. Disappear in drowsiness but reappear later in deep sleep.
        - **Theta** (4-7 Hz) – slower/lower frequency than alpha waves. **Drowsiness**/right after you fall asleep/when you are sleeping lightly.
        - **Delta** (0.5-3 Hz) – Slower/lower frequency than theta waves. **Deep sleep** or **coma**.
    - In sleep, the type of wave varies by stage.
- You might not be aware of shifting from one stage of sleep to another, but your brain knows. You have set of neurons that fire rhythmically) in your CNS , which lead to neural rhythms (also called oscillations and commonly known as **brain waves)** that can be measured by EEGs.

Sleep Stages and Circadian Rhythms

- **Sleep stages**: Your brain goes through distinct brain patterns during sleep. 4 main stages that occur in **90 min cycles**.
- First three stages are categorized in **non-rapid eye movement** sleep (**non-REM**) – N1, N2, N3
    - **N1 (Stage 1):** Dominated by **theta** waves.

        - Strange sensations – **hypnagonic hallucinations**, hearing or seeing things that aren't there ex. seeing flash of light, or someone calling your name, doorbell, etc.
        - Or the **Tetris effect** – if you play Tetris right before bed, you might see visual images of blocks during sleep. OR Ex. Been on a boat all day, you might still feel like you are on water even when on dry land
        - Also a feeling of falling – **hypnic jerks**- muscle twitches you sometimes experience as you fall asleep.
    - **N2 (Stage 2)** – deeper stage of sleep. People in N2 are harder to awaken. We see more **theta** waves, as well as **sleep spindles** and **K-complexes**.
        - **Sleep spindles** are a burst of rapid brain activity. Some researchers think that sleep spindles help inhibit certain perceptions so we maintain a tranquil state during sleep. Sleep spindles in some parts of brain associated with ability to sleep through loud noises.
        - **K-complexes -** supress cortical arousal and keep you asleep. Also help sleep-based memory consolidation (some memories are transferred to long term memory during sleep, particularly declarative/explicit memories). Even though they occur naturally, you can also make them occur by gently touching someone sleeping. "that touch was not threatening, stay asleep brain"
    - **N3 (Stage 3)** – slow wave sleep. Very difficult to awaken. Characterized by **delta** waves. Where sleep walking/talking in sleep happens. Declarative Memory consolidation. "regular breathing and regular slow brain waves"
- **REM (rapid-eye movement)** stage. Eyes move rapidly beneath your eyelids but most of your other muscles are paralyzed. Most dreaming occurs during REM sleep, so paralysation inhibits actions. Most important for **memory consolidation. Formation of episodic memories.** Combination of alpha, beta, and dyssynchronous waves, similar to beta waves seen when awake. Acronym: **BATS-Drink Blood (beta alpha theta sleep-spindle/K-complex delta beta)**
    - Sometimes called **paradoxical sleep**, because brain is active and awake but body prevents it from doing anything
    - Waking up during REM sleep allows you to remember your dream
    - REM sleep more before you wake up
    - More N3 sleep right as you go to bed
    - Consolidate procedural memories
- Cycle through these 4-5 times per sleep, each one 90 minutes. Order within cycle goes from N1 -> N2 -> N3 -> N2 -> REM → N1. How long each stage lasts depends on how long you've been asleep and your age (babies spend more time in REM sleep)



- **Circadian Rhythms** – why you get sleepy in afternoon. They're our regular body rhythms across 24-hour period. Controlled by **melatonin**, produced in the pineal gland.
    - Control our body temperature, sleep cycle, etc.
    - Daylight is big queue, even artificial light.
    - Also change as you age – younger people are night owls, but older people go to bed early.
    - Can prevent you from sleeping in.

Dreaming

- Everybody dreams during REM sleep. Can tell someone is dreaming because eyes are moving rapidly under eyelids, **and brainwaves look like they are completely awake**. These are the memorable dreams (NREM ones are not memorable)
- Activity in **prefrontal cortex** during REM sleep is **decreased** – part responsible for logic. Why things in our dreams can defy logic and don't seem weird.
- Why do dreams occur? Few theories:
- **Sigmund Freud**
    - Dreams are our unconscious thoughts and desires that need to be interpreted. Little scientific support.
- **Evolutionary biology**
    - Threat simulation, to prepare for real world.
    - Problem solving
    - No purpose
- **Other**
    - Maintain brain flexibility – allows us to learn and be creative when we are awake
    - Consolidate thoughts to long-term memory, and cleaning up thoughts. People who learn + sleep retain more than those who do not sleep. But role of REM is unclear.

- Preserve and developing neural pathways. Because infants constantly developing new neural networks spend most of time in REM sleep.
- Memory consolidation theorists believe memory consolidated in deep sleep.

Dream Theories – Freud and Activation Synthesis Hypothesis

- Do our dreams have a meaning?
  - **Sigmund Freud's theory of dreams** says dreams represent our unconscious feelings/urges/thoughts. Like an iceberg.
    - What happens? Literal meaning. **Manifest content**.
      - ex. Monster chasing you
    - What is hidden meaning? **Latent content**.
      - ex. Job pushing you out.
    - Dreams have meaning. Interpreting them can help us resolve and identify hidden conflict.
  - **Activation Synthesis Hypothesis**
    - Brain gets a lot of neural impulses in brainstem, which is sometimes interpreted by the frontal cortex.
    - Brainstem = activation, and cortex = synthesis.
    - Our brain is simply trying to find meaning from random brain activity. Therefore dreams might not have meaning.

Sleep Disorders

- People with **sleep deprivation** might be more irritable and have poorer memory and attention. Could be dangerous when it comes to flying airplanes or driving cars.
- Interesting more sleep = less accidents, less sleep = more accidents
  - Also more susceptible to obesity – body makes more cortisol, and the hunger hormone (ghrelin).
  - Can also increase your risk for depression. REM sleep helps brain process emotional experiences, which can help protect against depression (not certain about this link).
  - Can get back on track by paying back **"sleep debt"** (paying back sleep)
- How much is enough sleep? 7-8 hours for adults. Varies with age and individual. Babies need a lot more.
  - An infant (age 4 months to 11 months) should get at least 12 hours.
  - A preschooler (age 3 to 5 years old) should get at least 10 hours of sleep a night.
  - A school age child (age 6 to 13 years old) should get at least 9 hours of sleep a night.

    Older adults = at least 7 hrs
- More serious form – **insomnia** (persistent trouble falling asleep or staying asleep). Various medications but taking them too long leads to dependence and tolerance. If you rely on medication, you become more habituated to it and need more to get the same effects.

    - Treatments can involve psychological training and lifestyle changes (exercising regularly or relaxing before bed). This is a better alternative to medication.
- Other end of spectrum is **narcolepsy** – can't help themselves from falling asleep. Various fits of sleepiness, going into REM sleep. Have fits (usually 5 minutes) that can occur any time. 1 in 2000.
    - Cause is not completely known. Indications that it is genetic, and linked to absence of alertness neurotransmitter.
    - Neurochemical interventions can cause someone to overcome narcolepsy potentially.
- **Sleep apnea** – 1 in 20 people. People with it are often unaware. Stop breathing while sleeping – body realizes you're not getting enough oxygen, wake up just long enough to gasp for air and fall back asleep without realizing. Can happen 100x/night!
    - Don't get enough N3 (Stage 3; slow-wave) sleep.
    - Snoring is an indication, or fatigue in morning after full night of sleep.
- **Sleepwalking/sleep talking** – mostly genetic, occur during **N3** (stage 3; slow wave) and are harmless. Occur more often in children (partly because they have more N3 stage sleep than adults).

xBreathing-Related Sleep Disorders

- See below notes

Hypnosis and Meditation

- **Induced States of Consciousness:** Hypnosis + medication are examples. Does not occur naturally.
- **Hypnotism** usually involves getting person to relax and focus on breathing, and they become more susceptible to suggestion in this state – but only if they want to. More **alpha** waves in this stage – an awake but relaxed state.
    - Some use hypnosis to retrieve memories, very dangerous because memories are malleable. Can create **false memories (False memory)-** memories that incorporate hypnotizers expectations even when not intended.
    - Some people feel that hypnosis can control pain. Might help us inhibit our attention to painful stimuli. Only works if you *think* it will work.
    - 2 theories for how it works: **Dissociation Theory** (hypnotism is an extreme form of divided consciousness) and the **Social Influence Theory** (people do and report what's expected of them, like actors caught up in their roles)
    - Refocused attention, so sometimes it's used to treat pain. Reduced activity in areas that process sensory input. Although it doesn't block it out, it might inhibit attention that inhibit.
- **Meditation** – training people to self-regulate their attention and awareness. Can be guided and focused on something in particular, like breathing, but meditation can also be unfocussed – mind wanders freely.
    - More alpha waves than normal relaxation in light meditation.

- In deep meditation have increased theta waves in brain (only experts typically)
- No long term studies. But those who regularly go to deep meditation, have shown increased activity in prefrontal cortex, right hippocampus, and **right anterior insula** – increased **attention control** (the goal of meditation).
- Can be helpful for people with ADHD, or in aging.

Drug Dependence

Overview of Psychoactive Drugs

Psychoactive Drugs: Drugs that can alter our consciousness, and perceptions. They can alter our perception, increase our mood, calm us down, make us feel more alert, etc. Classified by action and effects they have on our bodies.

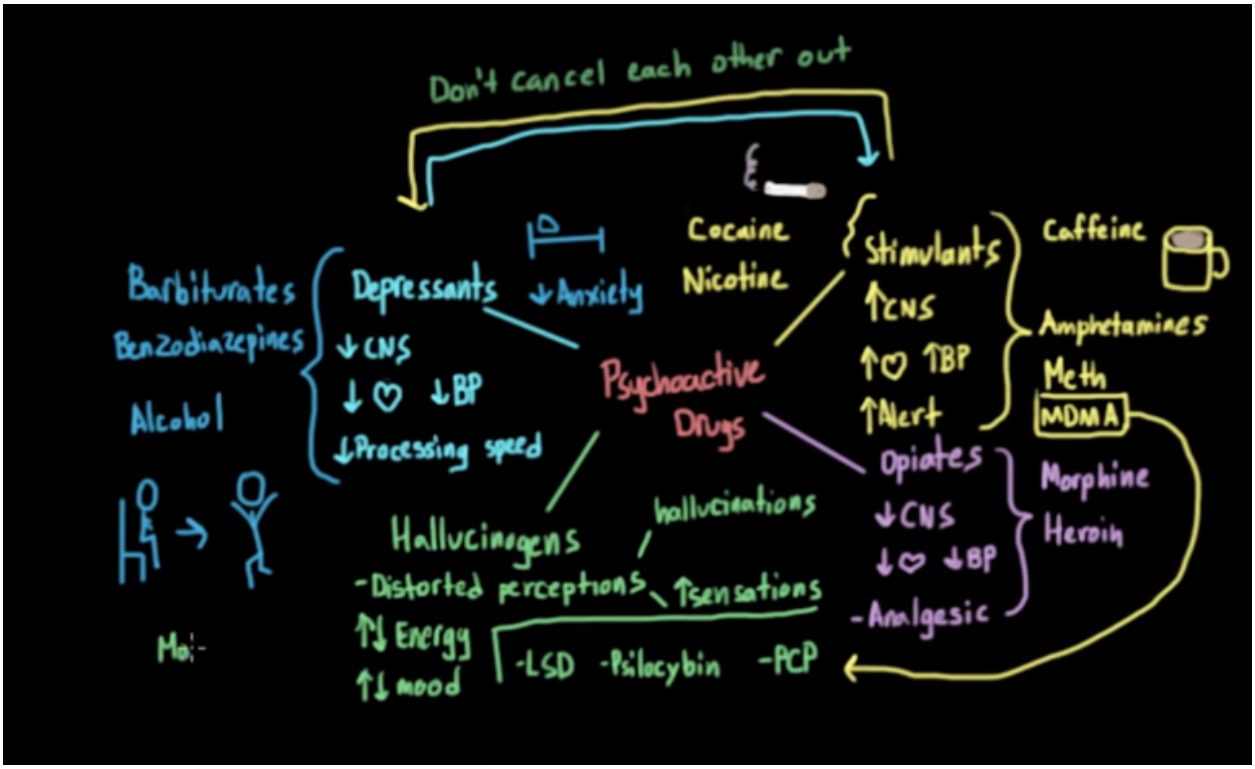
- 4 main categories of psychoactive drugs: depressants, stimulants, hallucinogens
- **Depressants** are drugs that lower your body's basic functions and neural activity, lower CNS activity (decrease arousal/stimulation in areas of our brain) ex. Decrease Heart rate, decreased BP, decreased processing/reaction time (makes us act/think slowly), etc. Three categories: alcohol, barbiturates, and benzodiazepines
  - **Vasodilate at low, vasoconstrictor at high**
  - The most popular depressant is **alcohol**.
    - Decreased inhibitions, so decreasing cognitive control
    - Lack of coordination, slurring of speech
    - Think more slowly, disrupt REM sleep (and form memories)
  - **Barbiturates** – used to induce sleep or reduce anxiety (calm them down) Depress your CNS. Anesthesia or anticonvulsant (drugs that reduce seizures)
    - Not often prescribed due to negative side effects such as reduced memory, judgement and concentration, with alcohol can lead to death (most drugs w/ alcohol are bad)
    - -barbital
  - **Benzodiazepines** are the most commonly prescribed suppressant. Subscribed for same things as barbiturates - sleep aids (to treat insomnia) or anti-anxiety or seizures (anticonvulsant)
    - Enhance your brain's response to GABA. They open up GABA-activated chloride (Cl-) channels in your neurons, and make neurons more (-) charged.
    - 3 types: short, intermediate, and long-acting. Short and intermediate are usually for sleep, while long acting is for anxiety.
    - -zelam, -zolam
    - Benzodiazepines and alcohol bind to a site on the $GABA_A$ receptor complex that regulates the sensitivity of the receptor complex.
- **Stimulants** are drugs that excite your CNS, increase HR/BP, alertness, more awake, more energetic. Can cause people to feel glittery. Examples include:

- Caffeine, Amphetamines (Adderall), Methamphetamines (Meth), MDMA (Molly/Ecstasy), Cocaine, Nicotine, THC (Marijuana/Cannabis – also a hallucinogen/depressant)
- Cocaine – can be used as a anesthetic/
- Vasodilate
- Effect is similar to stress, increased glucose metabolism in brain.
    - Cocaine: blocks dopamine reuptake.
    - Amphetamines both block dopamine reuptake and stimulate presynaptic dopamine release.
    - Caffeine inhibits the enzyme that breaks down cAMP (cyclic adenosine monophosphate).
    - Nicotine acts on acetylcholine
    - THC works on anandamide. Increase dopamine and GABA activity.
- Stimulants and depressants are functionally opposite but don't actually work on the same things at a neurochemical level. Drinking coffee after drinking alcohol won't make you sober; it will just make you an alert drunk person.
- Vasoconstrictor

- **Hallucinogens** (referred to as **psychedelics**):
    - Distorted perceptions/hallucinations - seeing or hearing things different from how things actually are.
    - Heighted sensations. Based on reality but is different from what's going on in the world around
    - Can give them energy or calm them down
    - Emotional responses - Feeling of connectedness and mood swings (changing moods)
    - Exact effect can be different depending on an individual's personality or who they are/who they are win
        - Examples:, mescaline, peyote, PCP, LSD, psilocybin (active ingredient in mushroom)
    - LSD modifies serotonin neurotransmission, especially the 5-HT2 receptor family.
    - Dilation of pupil (mydriasis)
- **Opiates/Opioids**
    - Opiates – natural
    - Opioids – synthetic
    - Like depressants: Decrease CNS function, decrease HR/BP, cause relaxation, induce sleep (hence can be used to treat pain and anxiety).
    - BUT it is **NOT** a depressant. Work on different mechanisms at the neurochemical level
    - Analgesic – reduce perception of pain
    - ex. heroine, codeine, morphine, oxycodone
    - Used to treat pain because they act at body's receptor sites for endorphins.
    - Different class than depressants, even though overlapping for anxiety, rest act on GABA receptors while opiates act on endorphin Receptors

- Lead to euphoria, why taken recreationally
- An opiate binds to opioid receptors by mimicking endorphins.
- Vasodilator, and pupillary constriction
- Die by respiratory failure

- **Cannabis (Marijuana)** – a mix of all. Can be a hallucinogen and also be a depressant or a stimulant
- **MDMA** can be a stimulant or hallucinogen.
- Drugs can be classified by legal status or how likely they are to be abused
  - Active substance: THC
  - Cannabis metabolites can be present in the blood of users for up to 3 months.
  - Tolerance can increase the amount of cannabis needed for impairment and THC metabolites and many other constituents of cannabis accumulate in fat cells for three months or more.



Psychoactive Drugs: Depressants and Opiates

- Psychoactive Drugs: Alter your consciousness by altering your perceptions and moods.
- Depressants: lower HR, reaction time, processing speed, slowing of neural processing/sympathetic nervous system. Act on GABA (inhibitory neuro transmitter) receptors, open up Cl- channels on your neuron and inhibit excitation.
- Alcohol – most common depressant.
  - Common depressant symptoms
  - Disrupts REM cycle – for memories /new synapses is reduced

    - Disinhibited - removes inhibitions. Acting on impulses. reduced self-awareness and control
    - Alcohol is a CNS depressant that is absorbed through the cell membrane.
- Barbiturates: used to be called a tranquilizer. Depressant.
    - Induce sleep, reduce anxiety.
    - Side effects: reduced memory + judgement + concentration
    - Combined with alcohol = leads to death
- Benzodiazepines (Benzos): depressant. Commonly prescribed.
    - Short-acting (preferred for insomnia) , intermediate acting, long acting (preferred to treat anxiety)
- Opiates: can be used to treat pain/anxiety
    - Examples: Opiates: (acronym: T = Tree = Natural). Morphine/codeine
    - Opioids: oxycodone/hydrocodone (prescription), heroin
    - Act on endorphin receptors. NOT a DEPRESSANT but can be used for anxiety/pain
    - Used to treat pain (endorphins)
    - Euphoria
    - Methadone = treatment
- Drugs and opiates can be addictive

Psychoactive Drugs: Stimulants

- **Stimulate** –stimulate or intensity neural activity/bodily functions.
- Range from caffeine to cocaine, amphetamines, methamphetamines, and ecstasy. In between is nicotine.
- **Caffeine** (inhibits adenosine receptors) can disrupt your sleep. Increases energy, can disrupt sleep for several hours
- **Nicotine -** Increase HR/BP. also disrupts sleep and can suppress appetite (why some people gain weight when they quit smoking)
    - At high levels, nicotine can cause muscles to relax and release stress-reducing neurotransmitters (to counteract hyper alertness).
    - Nicotine is a CNS stimulant, which works as an acetylcholine receptor agonist.
- Both caffeine and nicotine:
    - Physiologically addicting.
    - Withdrawal symptoms from both:
        - From coffee: irritability, difficulty concentrating, depression,
        - Nicotine: (more addictive than coffee) Anxiety, insomnia, irritability, distractibility
- **Cocaine** is even stronger stimulant – causes brain to releases so much dopamine, serotonin, and norepinephrine that it depletes your brain's supply. Intense crash and very depressed when it wears off.
    - Regular users can experience disturbances, emotional suspicion, convulsions, cardiac arrest, and respiratory failure.

- **Amphetamines and methamphetamines** also trigger release of dopamine, feeling of euphoria for up to 8 hours. Once effect wears off - experience irritability, insomnia, seizures, depression
    - Meth is highly addictive.
    - Long-term Meth addicts may lose ability to maintain normal level of dopamine because brain tries to adjust to intense highs.
    - Amphetamines block the reuptake of dopamine, which stimulates an increase in the release of dopamine from the presynaptic membrane.

Psychoactive Drugs: Hallucinogens

- Hallucinogens: These drugs cause hallucinations, altered perception/sensations.
- Many types of hallucinations. Some even have medical uses.
- **Ecstasy/MDMA/Molly**– synthetic drug between a stimulant and hallucinogen.
    - Like stimulant - Increases dopamine and serotonin and euphoria. Also stimulates the body's CNS. Effects include: high BP, dehydration, overheating, death
        - Can damage neurons that produce serotonin, which has several functions including moderating mood. No serotonin = depressed mood
    - Causes hallucinogen - hallucinations and heightened sensations, ex. artificial feeling of social connectedness and intimacy
- **LSD** – Prototypical hallucinogen. Interferes with serotonin, which causes people to experience hallucinations.
    - Hallucinations are visual instead of auditory
- **Marijuana** is also a mild hallucinogen. Main active chemical is THC, which heightens sensitivity to sounds, tastes, smells.
    - Like alcohol, (depressant) - reduces inhibition, impairs motor and coordination skills, perceptual skills
    - Disrupt memory formation and short-term recall.
    - Stays in body up to a week's so regular users need less of the drug rather than more to receive the same high.
    - Used as medicine to relieve pain and nausea
- Some hallucinogens are used for **PTSD treatment**. Allow people to access painful memories from past that's detached from strong emotions – so they can come to terms with it.

Drug Dependence and Homeostasis

- **Homeostasis** is how you maintain temperature, heartbeat, metabolism etc. Occurs even when you are resting. Takes place when you take drugs.
- For example, if you take amphetamines (stimulant that increases your heart rate), your body quickly tries to lower HR and get back to normal. Brain is smart about this.
    - If regular drug user, might take it at same time of day or at the same location.
    - For example, pretend you are cocaine addict and you are always in the same room when you inject yourself with cocaine. Your brain starts to recognize

external cues like room, needles etc (the whole process of getting cocaine) before you get cocaine. Your brain tells body to get head start – lowers HR before you take drugs –this is why you need higher dose over time. Habituation.

- What would happen if you get those cues and don't get the drug? You get a crash. Your body is below homeostasis (lower HR/metabolism). No high (which would occur if you took the drug) to counteract the slowing down your body has created.
- If you're in a new location but take same level of drugs, you might get overdose. This is because in the new location your body has not prepared by reducing HR/metabolism.

Routes of Drug Entry

- Routes of Entry: Oral, injection, inhalation,
- **Oral** is ingesting something, one of *slowest* routes because goes through GI tract – half hour. Ex. Pill, alcohol.
- **Inhalation** is breathing or snorting or smoking, because once you inhale goes straight to brain. Insufflation, inhaling drugs through the nose, is highly addictive but less addictive than drugs that are injected. – 10 seconds. *faster* Ex. Tobacco or cocaine .
- **Injection**- most direct, intravenous means goes right to vein. Takes effects within seconds. *Fastest* Can be very dangerous (likely to inject bacteria and unexpected toxins) especially when using an infected needle.
- **Transdermal** – drug is absorbed through skin, ex. Nicotine patch. Drug in patch has to be pretty potent, released into bloodstream over several hours.
    - Transdermal administration occurs slowly, since the drugs have to be absorbed through the skin before the effects can be felt.
- **Intramuscular –**needle stuck into muscle. Can deliver drugs to your system slowly or quickly.
    - Ex: Quick Delivery - epiPen – given to someone experiencing an allergic reaction which starts closing airways. EpiPen delivers epinephrine quickly and allows airways to open). Usually on thigh because it has the most access points to blood vessels
    - Ex: Slow Delivery Vaccines. Intramuscular delivery of vaccines is why your arm gets so sore after shots.

    - **Intramuscular** injection is the fastest route of entry. Most abused drugs are injected intravenously, however.
- Faster route of entry = more addictive potential.

Reward Pathway in the Brain

- When you first experience happiness/reward (verbal-praise pleasure, hug, ate cake) your brain is responding.
- Your brain says, "this was good", "let's do it again" (occurs in response to food, social interactions, sex, and stimulants such as cocaine, amphetamines, metaemphatime, MDMA, nicotine, caffeine). The drugs that activate this drug circuit more are more addictive.
- Brain releases neurotransmitter called **dopamine**. Produced in the **ventral tegmental area** (VTA), in the midbrain.
    - VTA sends dopamine to the amygdala (controls emotions), nucleus accumbens (NAcc , controls motor functions), prefrontal cortex (focus attention and planning), and hippocampus (part of the temporal lobe, involved in memory formation).
    - NAcc, amygdala and hippocampus are part of the **mesolimbic pathway**.
- Different stimuli active circuit to diff degrees.
- VTA releases dopamine to parts of brain that have dopamine uptake receptors–
    - Amygdala (connected to hippocampus that controls emotion) says this was enjoyable.
        - ex. This cake is delicious, I love this cake. I am feeling so happy right now.
    - Hippocampus remembers everything about this environments so we can do it again,
        - ex: Where am I at? Where am I eating this cake? Who am I with? Let's remember things about this experience
    - nucleus accumbens – controls motor function
        - ex. says let's take another bite.
    - Prefrontal cortex focuses attention
        - ex. puts attention to the cake.
    - You do it again, dopamine is released and you have continued pleasure.
- At same time dopamine goes up (increase sense of euphoria), serotonin goes down.
    - Serotonin - partially responsible for feelings of satiation. So if serotonin goes down, you are less likely to be satiated or content.
- Reward pathway cycle is very biologically driven.
- Evidence of reward pathway/biological basis of drug dependence: Comes from animal models
    - Scientists gave rats hooked up IV that gives them cocaine if they push a lever. When the rats do this, the rats learn quickly to push the lever. Rats will seek the drug and also will try to increase dosage if allowed.

- Addiction/reward pathway takes over rational choices. Negative consequences don't affect the brain.
    - Animal model:
        - If you give a non-addicted rat regular food it likes with a substance that makes it sick, the rat learns to avoid the food. It stops liking it.
        - If you give an addicted rat its favorite drug paired with a substance that makes it sick, it still wants that drug. I don't care! I need the reward!
- Addiction has physiological components as well
    - Increased genetic risk – if someone in your family has drug addiction, you have an increased risk as well.
    - Environment/your choices make a difference too.

Tolerance and Withdrawal

- **Tolerance** means you get used to a drug so you need more of it to achieve the same effect.
    - Ex. Just took cocaine, lots of dopamine in synapse. Post-synaptic neuron has receptors for dopamine. Long-term stimulation can lead to brain shutting down some receptor because of high levels of dopamine; therefore same amount of drugs won't cause same high. Called **tolerance.**
        - Tolerance is a shift in the dose-response curve that causes decreased sensitivity to a drug due to exposure.
    - With cocaine you have a dependence, (a feeling you need the drug, emotional state, physical dependence). You increase cocaine (drug increase)
- **Cross tolerance** - is a reduction in the efficacy or responsiveness to a novel drug due to a common CNS target.
- If you go through period of not having the drug, you experience **withdrawal symptoms**.
    - Things less strong as cocaine won't give you as strong of an effect, so dopamine levels decrease and you feel depressed, highly anxious, etc. (varies by drug).
    - Will do whatever it takes to get that high.
    - Once you've built up tolerance, need drug to feel "normal" again, not euphoric. This is a sign you are **addicted.**
    - However, with time and effort brain can reverse back and your reward system can get used to not having the drug and your reward system can begin functioning at a normal level.

Substance Use Disorders

- **Drugs** are *substances* (formal way to refer to a drug) that include alcohol, tobacco, cannabis, opioids (heroin/morphine), stimulants (cocaine/amphetamines), hallucinogens (LSD), inhalants, sedatives, caffeine
- We have to consider what happens when drugs enter the body and when they exit. Hence are 2 different processes: **intoxication** (when drug enters body and exerts effect on somebody) and **withdrawal** (exits after a period of use)

- **Intoxication** refers to behavioural and psychological effects on the person. These are drug-specific. Ex. “drunk” (intoxication w/ alcohol) or “high” (intoxicated with another substance)
- **Withdrawal** is when you stop after using for prolonged time. We get withdrawal symptoms. Can become sick or ill, or it can be fatal (depending on the substance/drug) Two Stages: **acute** and **post-acute**
    - **Acute** (few weeks, physical withdrawal symptoms, different for each drug/person). For alcohol, only 2 days after cessation of consumption, improvement seen 4-5 days.
    - **Post-Acute** (fewer physical symptoms, more emotional/psychologic symptoms, same symptoms for everyone)
        - Common symptoms: (PAWS – Post acute withdrawal symptoms) Mood swings, Anxiety, Irritability, Tiredness, Variable energy, Low enthusiasm, Variable concentration, Disturbed sleep
        - **Post-acute withdrawal feels like a rollercoaster of symptoms.** In the beginning, your symptoms will change minute to minute and hour to hour. Later as you recover further they will disappear for a few weeks or months only to return again. As you continue to recover the good stretches will get longer and longer. But the bad periods of post-acute withdrawal can be just as intense and last just as long.
        - **Each post-acute withdrawal episode usually last for a few days.** Once you've been in recovery for a while, you will find that each post-acute withdrawal episode usually lasts for a few days. There is no obvious trigger for most episodes. You will wake up one day feeling irritable and have low energy. If you hang on for just a few days, it will lift just as quickly as it started. After a while you'll develop confidence that you can get through post-acute withdrawal, because you'll know that each episode is time limited.
        - **Post-acute withdrawal usually lasts for 2 years.** This is one of the most important things you need to remember. If you're up for the challenge you can get though this. But if you think that post-acute withdrawal will only last for a few months, then you'll get caught off guard, and when you're disappointed you're more likely to relapse.
        - Can be trigger for relapse
- Can result in **substance-induced disorders** – conditions that are caused by substance. Can be substance induced mood disorders (high mood -mania/low mood - depression), or disorders related to anxiety, sleep, sexual function, psychosis (loss of contact with reality, characterized by seeing things, hearing voices, becoming paranoid).
- They can lead to **substance-use-disorders** - Occurs when use the drug causes a serious/real degree of impairment in functioning in life, at work, school, or home. Not

everyone experiences this (ex. Not everyone who drinks alcohol or smokes cigarettes have a substance use disorder)
    - With Substance-Use- disorder, we are looking at a *problem with their substance use*.
    - How do you know someone has a substance use disorder? By looking at their substance **usage**- are they using increasingly large amounts, stronger cravings (desires to use), more time recovering from it (or trying to get substance), failing to cut back, are they experiencing obligations related to work/home/school?
    - Second factor is presence of **withdrawal** – start feeling sick or unwell (after having stopped using drug). Suggests you're physiologically dependent. Can be dangerous (ex. alcohol withdrawal can lead to seizures which can lead to death). Withdrawal is specific to the substance.
        - ex. Alcohol withdrawal: Withdrawal symptoms can begin as soon as blood alcohol concentrations decline sharply. This often occurs within four to twelve hours after alcohol consumption has stopped. Symptoms of alcohol withdrawal can be alleviated through the use of benzodiazepines. Typically, acute withdrawal symptoms reach their peak two days after cession of alcohol consumption and improve within four or five days. Peak of symptoms is around 2 days ~ and then start showing improvement 4-5 days.
    - Also **tolerance** – your body adapts or builds a tolerance to the substance. Effect decreases with equal dose. They increase dose to get same level of intoxication.
- There are different severities of substance-use disorders from mild, medium, to severe.
- With caffeine, only drug for which we can't develop substance-use disorder.

Treatments and Triggers for Drug Dependence

- Drug Addiction is a medical problem that has a physiological or psychological component
- Treatments for a drug addiction address both physiological + psychological symptoms.
- For serious addictions, hospitalization might be needed as the patient goes through withdrawal, to ensure patient doesn't hurt themselves, and the patient gets used to operating w/o drug
- To treat, detoxification (detox) – separating addict from the drug. Sometimes require strong medications for strong addictions (have to break the addiction cycle). Often have to address symptoms such as vomiting, nausea, pain, etc.
    - Ex. Opioids such as heroine act at neural receptor site for endorphins to reduce pain and give euphoria (a highly addicting substance). **Methadone** activates opiate receptors, but acts more slowly, so it dampens the high. Reduces cravings, eases withdrawal, and if heroine is taken the user can't experience the high because receptors are already filled with longer-acting methadone.
    - Ex. For stimulants like tobacco (addictive ingredient: nicotine) , medications replace nicotine by delivering low levels of nicotine through patch, or deliver

chemicals that act on nicotine receptors in brain. In this case prevents release or reuptake of dopamine. Help reduce cravings.
    - For alcoholics, meds block receptors in reward system of alcohol. Also reduce symptoms of withdrawal and cravings. Reduce withdrawal symptoms such as anxiety, insomnia, and dysphoria (dissatisfaction with life)). Important to prevent relapse during this early stage by minimizing negative symptoms.
- **Inpatient treatments** require residence at a hospital or treatment facility, **outpatient treatments** means they can live at home and come in for treatment. Most treatments can occur in either setting, just depends on what is best for the patient.
- **Cognitive behavioural therapy** (**CBT**): Psychological treatment for drug treatment. Addresses both cognitive and behavioural components of addiction. Patients learn to recognize problematic thought patterns and develop more positive thought patterns and coping behaviors. They learn to anticipate problematic situations (ex. Going to a party where there is alcohol for an alcoholic) and to self-monitor for cravings so they can apply their coping strategies early. Used successfully for patients addicted to alcohol, cocaine, methamphetamine, and nicotine
    - Skills people learn in CBT are long-lasting! Last after therapy ends.
- **Motivational interviewing** involves working with patient to find intrinsic motivation to change. Very focus, goal directed therapy. Few sessions and can be doorway for patient to engage in another treatment (like CBT or group meetings).
- **Group meetings** such as AA (alcohol anonymous) or NA (narcotics anonymous) involve 12-step program that help people go through process of recovery.
    - Three categories of 12 steps:
    - Acceptance -acknowledge addiction is a chronic progressive diseases that you can't control on your own. "I have a problem"
    - Surrender – give yourself over to higher power and accept help offered through that power and group
    - Active Involvement in meetings/activities – can include helping other addicts
    - Evidence they're helpful, particularly for alcohol
    - Steps are sequential but one can experience certain steps repeatedly over time.
    - Sometimes there are parallel group meetings for families of recovering addicts. Can help people in addicts life understand problem and also help their loved one
- **Relapse** is when patient can slip and go back Depends on environmental triggers and drug they were addicted too. More addictive substances make relapse more likely. Encountering anything that one used to associate with the drug makes relapse more likely as well. This is why it's hard for people to stay clean (same situation, group of friends, apartments, etc – these cues can trigger relapse …why CBT can be helpful).

Attention

Divided Attention, Selective Attention, In-attentional Blindness, and Change Blindness

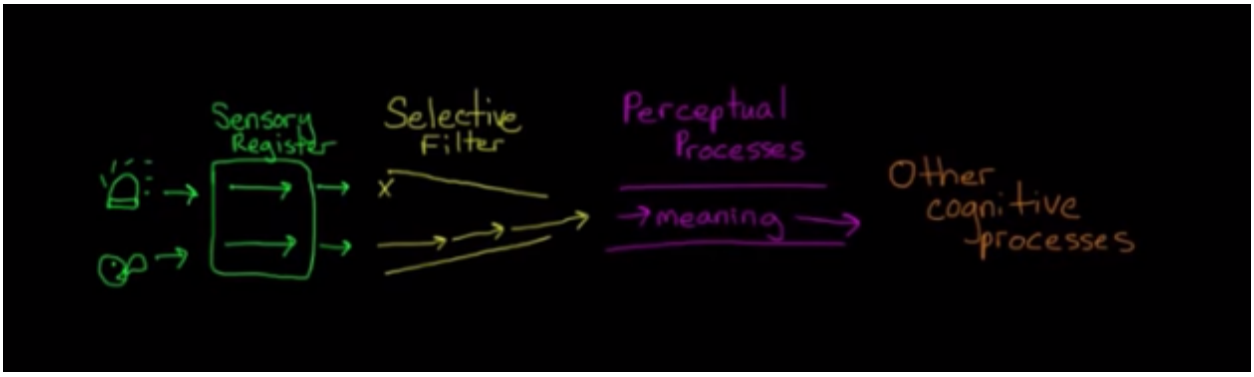
- **Divided Attention**: attention is a limited resource. Can't split it very well. Doing 2x at once you end up switching between tasks rather than doing them simultaneously. Divided attention occurs when an individual must perform two tasks which require attention, simultaneously.
- Joint attention is the focusing of attention on an object by two separate individuals.
- **Directed attention** allows attention to be focused sustainably on a single task, in this case a single orientation of the Necker cube.
- **Attention**: focus/concentrating on something at the exclusion of the other stimuli in environment.
- When you divide your attention on one task between 2 (ex: watch TV and studying together) you're exercising your **selective attention**: you are selecting one at a time (either TV or studying – can't do both). It's like a flashlight on your attention –you can move it around at any spot. At any given moment illuminating one area of interest. Only have ability to focus on one thing at the exclusion of everything else.
- Selective attention is the ability to maintain attention while being presented with masking or interfering stimuli.
    - 2 types of cues that can direct our attention – exogenous and endogenous
        - **Exogenous /External Cues**: Don't have to tell ourselves to look for them in order for them to capture our attention Ex. Bright colors, loud noises, "pop-out effect")
            - Exogenous attention is driven by bottom-up or external events, i.e. pop-out.
            -
        - **Endogenous Cues / Internal Cues** - Require *internal* knowledge to understand the cue and the *intention* to follow it Ex. A mouse arrow, would need internal arrow of what an arrow is to follow it and to know it's not just a random line.
            - Endogenous attention is driven by top–down or internal events, i.e. the cocktail effect.
            - **Cocktail party effect** – ability to concentrate on one voice amongst a crowd. Or when someone calls your name (endogenous cue: meaning of name draws attention)
- **In-attentional blindness** – aka **Perceptual Blindness** - we aren't aware of things not in our visual field when our attention is directed elsewhere in that field. "miss something right in front of you"

    - In-attentional blindness is the inability to recognize an unexpected object, event, or stimulus that is in 'plain sight'. This is due to a psychological lapse in attention, rather than a defect or deficit in sensory perception.
    - Ex: you can't say where the nearest fire extinguisher is because you fail to notice it because your attention is typically elsewhere. This is true even though fire extinguishers are brightly colored and essential to survival (which should bring them to your attention)
- **Change blindness** – fail to notice changes from a previous to a current state in environment. (Different from in-attentional blindness, a subtle but importance difference) ex: don't notice when your mom gets a haircut.
    - Ex. Famous study done where a person asks a stranger in a big city to give directions. The person is swapped with another person and the direction giver does not notice that this was a different person that they were now giving directions too
- **Distal stimuli** are objects and events out in the world about you. Aware of and respond to this – this is what is important.
- **Proximal stimuli** are the patterns of stimuli from these objects and events that actually reach your senses (eyes, ears, etc.). It is the light that is actually falling on the retina.
- **Covert orienting** is the act of bringing the spotlight of attention on an object or event without body or eye movement.
- **Overt orienting**, a person turns all or part of the body to alter or maximize the sensory impact of an event.
- **Attentional capture** occurs when attention is attracted by the motion of an object or stimulus.
- **Neglect syndrome -** occurs when damage to the brain causes a change or loss in the capacity of the spatial dimension of divided attention.
- **Vigilance attention and signal detection** are processes that attempt to detect a signal or target of interest. This allows responses to be primed and quick actions undertaken in response to the signal or target of interest, i.e. a pothole in the road is detected and avoidance actions are undertaken.
    - Vigilance (like active search, selective attention, and divided attention) is a type of attention. These types of attention are often described as main functions rather than subfunctions of attention.
- Previous practice on any skill will improve performance. Although too high of an arousal state can be detrimental to attention, enhanced arousal can enhance attention. A person who is skilled at a task will require less attention to complete that task. A difficult or novel task will require more attention than a practiced or skilled task.
- Alerting attention is affected by regular aging but deficits are not often associated with schizophrenia. Neurotransmitter modulation of this attentional network is associated with norepinephrine produced in the locus ceruleus.

- Orienting attention involves the capacity to change the focus of attention from one stimulus to another stimulus. This network is predominantly modulated by acetylcholine produced in the basal forebrain.
    - Basal forebrain: The **basal forebrain** is a collection of structures located to the front of and below the striatum. It includes the nucleus accumbens, nucleus basalis, and medial septal nuclei. These structures are important in the production of acetylcholine, which is then distributed widely throughout the brain. The basal forebrain is considered to be the major cholinergic output of the central nervous system (CNS).
- **Executive attention** is involved in goal-directed behavior, monitoring conflicts between internal processes, and anticipating the effects of behavior. Dopamine from the ventral tegmental area is associated with executing attention.

Theories of Selective Attention

- How do we filter out the unimportant information? How do we decide when to shift our attention to something new?
    - Ex: you are in a loud crowded room, you can still attend to one person who is talking to you, but you still hear pieces of information that you are not attending to.
- **Selective Attention** – ability to focus on task at hand while ignoring other information.
- **Shadowing task** – Experiment that studies selective attention. In this task you are wearing headphones and they have two different sounds in each. Left ear hear one thing, right ear another thing. Told to repeat everything said in one ear and ignore the other. Focus on one ear and ignore the other (selective attention). Based on the unattended information that we do and don't end up comprehending - we can learn about how selective attention works by seeing what they filter out in other ear. 3 theories
- 1) **Broadbent's Early Selection Theory**
    - All information in environment goes into **sensory register** (which briefly registers/stores EVERYTHING/all sensory information you receive such as words, clicks, sirens, etc) then the info gets transferred to **selective filter** right away which identifies what you are supposed to be attending too via basic physical characteristics and filters out stuff in unattended ear based on things you don't need to understand to identify (based on voice, pitch, speed, accents, etc) and finally information moves to **perceptual processes** identifies friend's voice and assigns meaning to words. Then you can engage in other cognitive processes such as deciding how to respond.
        - Sensory register → selective filter → perceptual process → Conscious.
    - Some problems – if you completely filter out unattended info, shouldn't be able identify your own name in unattended ear → but, you can as explained by Cocktail party effect.



- 2) **Deutch & Deutch's Late Selection Theory**
  - Places Broadband selective filter **after** perceptual processes. This means that you DO register and assign everything meaning but then ***selective filter*** decides what you pass on to conscious awareness.
    - Deutsch and Deutsch's late selection theory moved the selective filter from before perception to after the perceptual process.
    - Sensory register → perceptual process → selective filter → Conscious
  - Some problems – This whole process has to occur quickly, but given limited resources of attention and knowing are brains are super-efficient it seems wasteful to spend all that effort assigning meaning to things first which you won't ever need.
  - Acronym: The Dutch pay attention (perceptualize) to EVERYTHING!
- 3) **Treisman's Attenuation Theory**
  - Instead of complete selective filter, have an ***attenuator – weakens*** but doesn't eliminate input from unattended ear. Then some gets to perceptual processes, so still assign meaning to stuff in unattended ear, just not high priority. Then switch if something important.
    - Treisman's Attenuation theory replaced the selective filter with an attenuator, which selectively allows the attended message to be processed to a greater extent than the unattended message.
    - Sensory register → attenuator → perceptual process →→ Conscious
    - Acronym: Triessman is SHARP as a T. He is smart enough to only attenuate and then perceive.
- Later experiments showed that difficulty of task being attended to can affect when filtering occurs and how long it takes.
  - Johnson and Heinz proposed that the location of the information attenuator (sometimes described as a bottleneck) was able to be varied by the listener depending on the demand necessitated by a particular attention task.
    - Acronym: Johnson & Johnson and Heinz catch-up can be anywhere.
- Still debate about which theory is best, but the three theories are pivotal in our understanding of selective attention. Important to consider because attention is important in all other cognitive functions we perform.

- Ex: If we couldn't filter between noises we didn't want we couldn't learn anything and if we couldn't refocus on unattended information we wouldn't be able to tell a car is coming towards us or someone yelling "fire"

The Spotlight Model of Attention and Multitasking

- **Selective Attention**: We take information from our environment, but we don't consciously process all of it. You probably see everything, but don't attend to it consciously. We can attend to only a small amount of info @ a time, but we see a lot of info!
- **Spotlight model of attention.** Selective attention – takes info from 5 senses, but don't pay attention to everything.
  - Aware of things on an unconscious level – ex. **Priming**, where exposure to one stimulus affects response to another stimulus, even if we haven't been consciously paying attention to it.
  - We're primed to respond to our name. Why it's a strong prime for pulling our attention.
- **Resource model of attention** – we have limited resources in attention. Resources that are easily overtasked if we try to pay attention to multiple things @ once.
  - Both models say something about our ability to multitask – not very good at it.
  - Supported by research study: ex. Dichotic listening task, you aren't able to focus on both the "attended channel" and the "unattended channel". You are able to recall info from the attended channel, but not the unattended channel.
- **Multitasking/divided attention**
  - What about talking on phone or texting while driving? Maybe not multitasking, just switching spotlight (attention) back and forth.
    - Results in a high # of car accidents
  - What about singing along to radio or talking to a passenger while driving?
  - Three factors have an influence our ability to perform multiple tasks at once:
  - **Task similarity** – ex. Listening to radio or listening to interview while writing a paper. Better to listen to classical music, because harder to multitask with similar tasks. Easier to multitask with music.
  - **Task difficulty** – harder tasks require more focus. Ex. Texting while driving is more difficult than talking to a passenger in a car. Also, you turn off/down radio in an unfamiliar town…because driving requires more focus/becomes a harder task when you don't know where you are going.
  - **Practice** – activities well practiced become automatic processes, or things that occur without need for attention. Whether task is ***automatic vs controlled*** is determined by the amount of practice. A controlled task is harder, and would struggle to complete if attention is divided. Automatic task occurs with greater experience.

- In general, **multitasking** is not as efficient as working on a single task, even if the tasks are relatively simple. This is true when it comes to learning as well (high levels of FB/text messaging) while studying correlated to poor student grades.

Memory

Information Processing Model: Sensory, Working, and Long-term Memory

- **Information processing model** proposes our brains are similar to computers. We get input from environment, process it, and output decisions. Doesn't describe where things happen in the brain. **INPUT → PROCESS → OUTPUT**
    - The information-processing model is a bottom-up or stimulus driven model.
    - The information-processing model assumes limited storage capacity.
    - The human brain is believed to have a limited capacity for attention.
    - **The information-processing model assumes serial processing; however, the human brain has the capacity for parallel processing.**

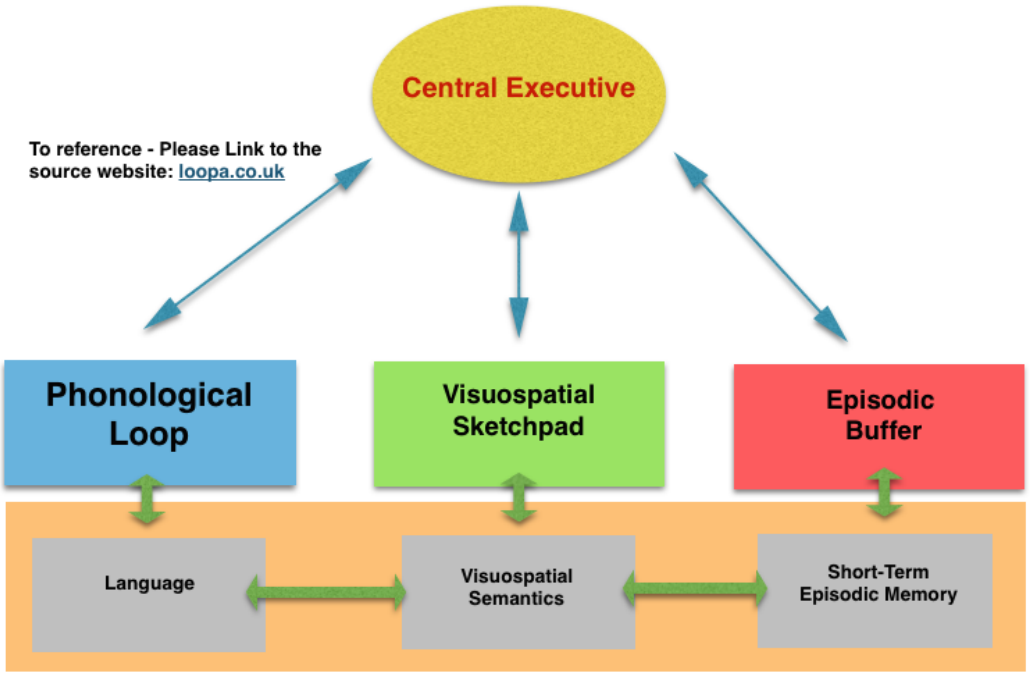
    - First stage is getting the input – occurs in sensory memory **(sensory register**). Where you first interact with information in your environment. Temporary register of all information your senses you're taking in.
    - **Sensory Memory (Register)**: Two components based on type of input. You have **iconic** (memory for what you *see*, lasts half a second) and **echoic** (what you *hear*, lasts 3-4 seconds) memory. Defined by time.
        - **Partial Report Technique**: Report one part of a whole field in cued recall. The **partial report** condition required participants to identify a subset of the characters from the visual display using cued recall. The cue was a tone which sounded at various time intervals (~50 ms) following the offset of the stimulus. The frequency of the tone (high, medium, or low) indicated which set of characters within the display were to be reported. Due to the fact that participants did not know which row would be cued for recall, performance in the partial report condition can be regarded as a random sample of an observer's memory for the entire display. This type of sampling revealed that immediately after stimulus offset, participants could recall most letters (9 out of 12 letters) in a given row suggesting that 75% of the entire visual display was accessible to memory
        - **Whole** Report Technique: The **whole report** condition required participants to recall as many elements from the original display in their proper spatial locations as possible. Participants were typically able to recall three to five characters from the twelve character display (~35%).[1] This suggests that whole report is limited by a memory system with a capacity of four-to-five items.

- **Working memory (Short–Term Memory):** is the sensory information you actually process. Consists of what you are thinking about at the moment. Capacity is Magic number 7 . Working memory can hold **7 +/- 2** pieces of info at a time. Why phone #s are 7 digits long. Does vary based on how complicated the stimuli are, how old you are. Different components to process input. **Working memory is memory that is stored while it is held in attention.**
    - Explains the **serial position effect** (primacy and recency effects)
    - Processing occurs at the visuo-spacial sketchpad and phonologic loop.
        - **Visuo-spatial sketchpad**: *Visual + spatial info* are processed in the
        - **Phonological loop**: verbal info (any words + numbers in both iconic and echoic memory) is processed. Ex. Repeating a phone # to yourself. **The Phonological Store is believed that the phonological store capacity is around 2 seconds.**
    - What about visual + verbal info (like a map that has street names and landmarks). Need coordination of the visuo-spacial sketchpad and the phonologic loop– the **central executive** fills that role. (Acronym: Central Cities Executive Traffic Cop directs memory components). The central executive tells the visuo-spacial sketchpad + phonological loop to coordinate. The Central Executive supervises the cognitive process of memory.
    - This creates an integrated representation that stores it in the **episodic buffer**, which acts as a connecter for information to be stored in long-term memory.
    - The **dual coding hypothesis** says it's easier to remember words associated with images than either one alone. Can use the **method of loci** – imagine moving through a familiar place and in each place leaving a visual representation of topic to be remembered.
    - **Operational Span Testing:** A task in which subjects are asked to perform a simple mathematical verification (e.g., 4/2 +1 = 3) and then read a word, with a recall test following some number of those verify/read pairs. The maximum number of words that can be recalled is the "operation span".
- Final stage is **long-term memory**. Capacity is unlimited. 2 main categories: explicit (declarative) and implicit (non-declarative). It is unlimited.
    - **Explicit Memory** /Declarative are *facts/events* you can clearly/explicitly describe. Explicit memory is a type of long term memory that focuses on recalling previous experiences and information. Explicit memory can be divided into two categories, episodic and semantic.
        - Anytime you take vocabulary test or state capitals you're using **semantic memory** (has to do with words/facts). So remembering simple facts like meanings of words.
        - Second type is **episodic memory** (event-related memories…like your last birthday party.).
    - **Implicit Memories /Non-Declarative** involve things you may not articulate. **Implicit memory** is a type of memory in which previous experiences aid the performance of a task without conscious awareness of these previous

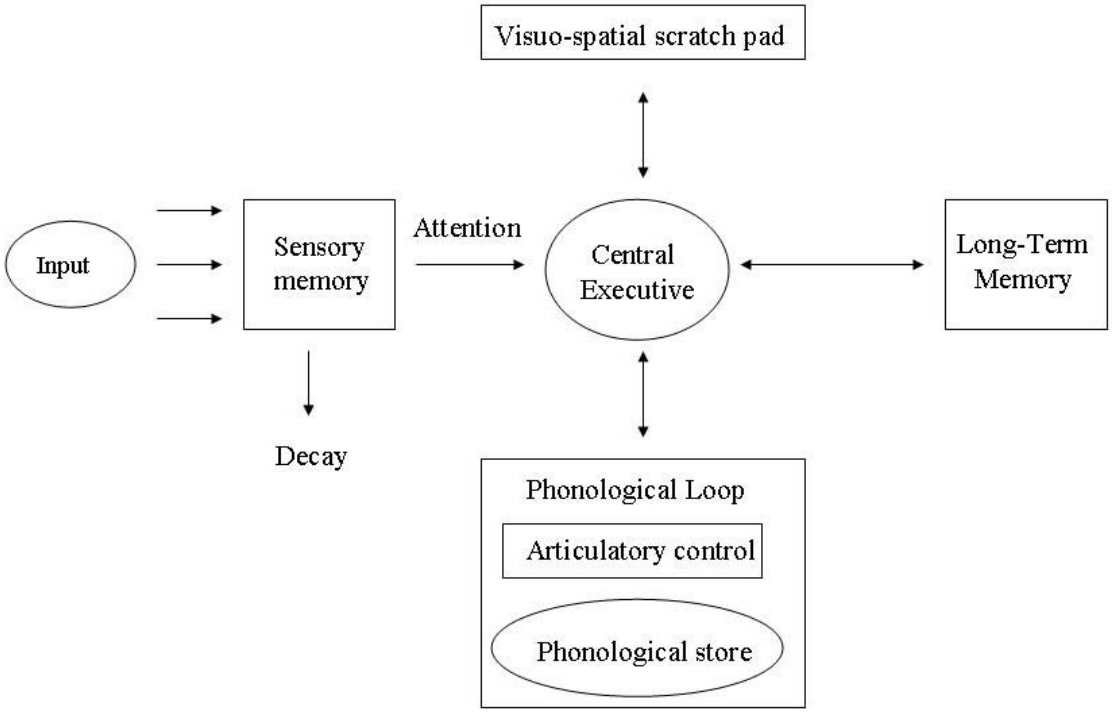
experiences.[1] Evidence for implicit memory arises in priming, a process whereby subjects are measured by how they have improved their performance on tasks for which they have been subconsciously prepared. – such as riding a bicycle, **procedural memories**.

- All memories formed by conditioning are implicit memories.
- Implicit memories are formed unconsciously.
- All habits are procedural memories, a type of implicit memory.
- Memories that inform unconscious motor skills are procedural memories, a type of implicit memory.
- Procedural memory is long-term memory for actions or habits such as how to kick a ball or washing hands before eating. Procedural memory is type of implicit memory.
- Habit learning occurs in a specific type of implicit memory.
- Habits/Implicit memory is stored in the basal ganglia.

- Implicit memories are non-declarative and unconscious, while explicit memories are declarative and conscious.
- Other is **priming** – previous experiences influence current interpretation of an event. refers to the change in the response towards a stimulus due to a subconscious memory effect. **Priming** is an implicit memory effect in which exposure to one stimulus (i.e., perceptual pattern) influences the response to another stimulus.
    - **Negative priming** is an implicit memory effect in which prior exposure to a stimulus unfavorably influences the response to the same stimulus. Caused by experiencing the stimulus, and then ignoring it. Negative prime lowers the speed to slower than un-primed levels
    - **Positive Priming;** A positive prime speeds up processing. caused by simply experiencing the stimulus. Positive priming is thought to be caused by spreading activation. This means that the first stimulus activates parts of a particular representation or association in memory just before carrying out an action or task. The representation is already partially activated when the second stimulus is encountered, so less additional activation is needed for one to become consciously aware of it.



Working Memory Model (Baddeley and Hitch, 1974)



- **Autobiographical memory** is a **memory** system consisting of episodes recollected from an individual's life, based on a combination of episodic (personal experiences and specific objects, people and events experienced at particular time and place) and semantic (general knowledge and facts about the world) **memory**.

Encoding Strategies

- You can remember the general idea of what you did, but not the specifics unless you encode and spend effort to do so.
- **Encoding** is transferring information from the temporary store in working memory into permanent store in long-term memory.
    - **Working Memory:** processing anything that you're thinking about at this particular moment. 7+/- 2
    - If you want to remember more than 7 things, need to process that info so it stays in long-term memory.
- Encoding is more successful when more cognitive effort is actively used. Combining encoding strategies is more useful than using only one.
- **Encoding Specificity:** Enhanced memory when testing takes place under the same conditions as learning.
- **Rote rehearsal** – Say the same thing over and over remember. least effective technique. Ex. Remembering someone's name is bob that you just met, and you can't after a while. Doesn't require you to process the information. More successful techniques involve tying in the new information to previously known information.
    - Rote rehearsal is simply repeating information. It requires the least amount of cognitive effort.
- **Chunking** – we group info we're getting into meaningful categories we already know to ease memorization.
    - Ex: Chunk the following list : bananas, oranges, blueberries, bread, rice, chicken, peanuts, baking soda, flour, eggs, butter
        - Bananas, orange, blueberries = fruits
        - Bread, rice = grains
        - Chicken , peanuts = proteins
        - Baking soda, flour, eggs, butter = baking supplies
        - Example Illustrates that it's easier to remember things if they are *chunked/*tied together in some way.
- **Mnemonic Devices** – Link what you are trying to learn into previously exist long-term information that is already in your memory. Types of mnemonics:
    - **Imagery** - crazier the better
    - P**egword system** - Verbal anchors link words that rhyme with the number – EX.1 is bun, 2 is shoe, 3 is tree, 4 is door, 5 is skydive, 6 is sticks, 7 is heaven, etc. Then you pair list to each of the words you are trying to remember using imagery (another mnemonic technique) like Broccoli looks like a tree so it's 4^{th} on the list.

    - **Method of loci** - good for remembering things in order, link info to locations. Tie information you need to remember to certain stops along a route that you already know. Ex. Bananas raining down on bus stop you get on, next stop there are oranges being thrown at, and the final stop you have a cat eating blueberries. Again, this method also ties imagery.
    - **Pegword + Method of Loci** (two methods that are good for remembering things in order that you already know. Verbally anchors and links words).
    - **Acronym** – each of the letter of a popular word you know stands for the first letters of a set of words you need to remember. [ex. HOMES to remember Great lakes of the US – Huron, Ontario, Michigan, Erie and Superior]
- **Self-referencing** – think about new info and how it relates to you personally. Ex: Imagine learning something about history, you then learn the information by talking to the general.
    - Related idea: <u>preparing to teach</u> – idea that you are learning this material in order to teach it to someone else. You learn it a lot better because you put more effort into organizing it and understanding the information the best you can. (involves great deal of processing)
- **Spacing** – spreading out study sessions overtime in shorter periods rather than cramming them into one study session. [spacing effect]
    - Ex: Most people think if they have 5 hours to study they should study immediately before so it is "fresh in your mind" but if you put in 5x 1 hr sessions you will learn the information in the long term far better.
- One reason it is thought to be helpful is it lets you know what you don't know while you start your studying and it also introduces a form of self-testing so you are able to prepare yourself.
- Most mnemonic devices/encoding techniques = greater likelihood of remembering information later. Do require more effort, but make studying quicker/more effective.

Retrieval Cues

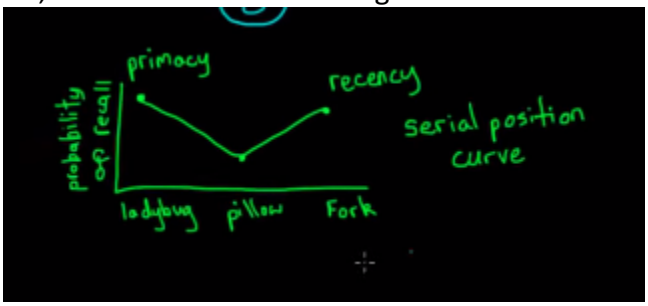
- **Retrieval**: Trying to remember/call up a memory of something you learned before. Successful retrieval depends on being able to use cues around you and to recognize the association between cues present at encoding and cues present at retrieval. Best types of cues are the associations that form when you are actually encoding.
- **Priming** – prior activation of nodes/associations, often without our awareness. Ex. hearing a story about apple and asked to name word starting with A. Ex: reading a story that is about rabbits and then hearing the word hair/hare – you are more likely to think of the word as hare.
- **Context** – the environment you encode and take the test (retrieve the information) is helpful. . Not always the case, so if you can't take test in same place, studying in different places gives you diff cues for retrieval – so multiple cues that will help you remember the material.

- Ex: Scuba divers learnt info in water or on land, then later tested in water or land. Those people who learned and were tested in the same place scored better than learning in one location than getting tested in another.

- **State-dependent** – your state at the moment you encode. When you are in a certain mood when you encode you can then remember it when you are in the same mood.
  - Ex. If you learn something while drunk you'll remember next time you're drunk – this happens because being drunk provides an internal retrieval cue to your brain.
  - Mood can be a cue for state dependent memory to. Like if you are sad/angry it can lead to remembering other times you were sad/angry. This can lead to thinks like depression because those feeling down are more likely to think of other reasons to be down. Converse is true as well, when you are happier you are more likely to think of other times you were happy (or are likely to interpret other events in a positive light).
    - This also happens with advertisement that associate a product with a certain mood. Next time you see a product, it is likely to be a cue for a happy mood and you are more likely to buy it. Or next time you're in that mood you will remember that product.

Retrieval Cues: Free Recall, Cued Recall, and Recognition

- **Retrieval** - Anytime you pull something out of long-term memory, and bringing it into conscious memory (working memory) you're engaging in retrieval.
  - Ex: Process is occurring every time you need to remember a name, bday, directions, etc.
- Memory of retrieval from most difficult to easiest: Free Recall, Cud recall, recognition.
- **Free recall** - no cues in recalling. Better recalling first items on a list (**primacy effect**) as well as last few (**recency effect**). Harder to remember things in the middle of a list. Recency effect is not as strong if there is an interpretation after list is called. Curve is called the **serial position curve/effect:** the overall tendency to recall first few items well, last few items well, and middle items not so great.



- **Cued recall (Recall cues)–** Having extra clues to remember the words. Still have to produce an answer but still get more cues to help you. The added cues help you retrieve the information from your long term memory. Get more retrieval cues, tend to do

better than free recall. For example, giving you the cue of "pl____" and asking for what word was on a list and you answer "planet". This would be easy.

- **Recognition** – best out of the 3 tests/easiest to recall. Present two words, and say which one you heard. Retrieval of correct word is highly likely. Ex. What was on the list? Fork or spoon and you answer fork.

Memory Reconstruction, Source Monitoring, and Emotional Memories

- Brain doesn't save memories exactly/perfectly. Every time we retrieve a memory we change it in small ways, according to our goals/mood/or environment. Sometimes these alternations are due to our own desires and moods. If there is a gap in our memory – our brain might fill it in with something logical or desirable.
    - Ex: Someone tells a story about a fish they caught. Every time they tell the story, the fish gets bigger.
- Sometimes information we retrieve is based on a **schema** (mental blueprint containing common aspects of world), instead of reality.
- **False information** – inaccurate recollections of an event.
    - Ex: Experiment done where participants watched a car stop at a yield sign. After the video, participants were given a written description on what happened, and some of the descriptions included false information about the car stopping- saying that the car stopped at a stop sign instead of a yield sign. Those who got the false information, more likely claimed the car stopped at a stop sign than the yield sign.
- **Misleading information** –
    - **Ex**: Participants watched a traffic safety video in which they observed a car crash, and then then participants were asked questions on what happened and the key question was "how fast cars were the cars going when they hit each other" "Some people got the question with the word "hit" and some got "smash". Those participants who received the question with the word "smashed", they were more likely to say there was glass on the ground in the video (even though there was not any glass on the ground)
- False/misleading information is problematic for police officers to ask leading questions. Even simple phrases can impact recall.
- When people recall information they often forget the information's source – an error in **source monitoring**. (ex. Can forget if the yield sign was in original video or in the written description even if you were able to identify you saw the yield sign OR ex. people might have difficulties calling out memories of a video car crash from other car crashes they remember or from movies where there was glass on the ground)
    - Source monitoring can be improved by using more retrieval cues, discovering and noting relations and extended reasoning. ex. angry with someone but forgot it happened in a dream. Or recognize someone but don't know from where.

        - **Source amnesia** is the inability to remember where, when or how previously learned information has been acquired, while retaining the factual knowledge.
- **Emotional memories** can be positive or negatively valenced. Highly emotional memories that feel extremely vivid are called **flashbulb memories** (term coined by Brown and Kulik (1977)) – and even though they seem as real as life, they are still susceptible to reconstruction as less emotional memories.
    - **Flashbulb memories:** people claimed to remember detail of what they were doing when they received news about an emotionally arousing event.
    - Ex. your memory about your birth can be positively valenced while memory of planes hitting twin towers on 9/11 might be negatively valenced), but highly vivid memories are called.
- Reconstruction isn't very drastic often so it's not like everything you remember is a lie. But, you should understand that video is not a video recorder, it is not perfect. It is an organic connections of neural connections in your brain which can be altered and reformed each time they are exercised.
- Inattention = impacts memory formation negatively (being bored would do this)

Long Term Potentiation and Synaptic Plasticity

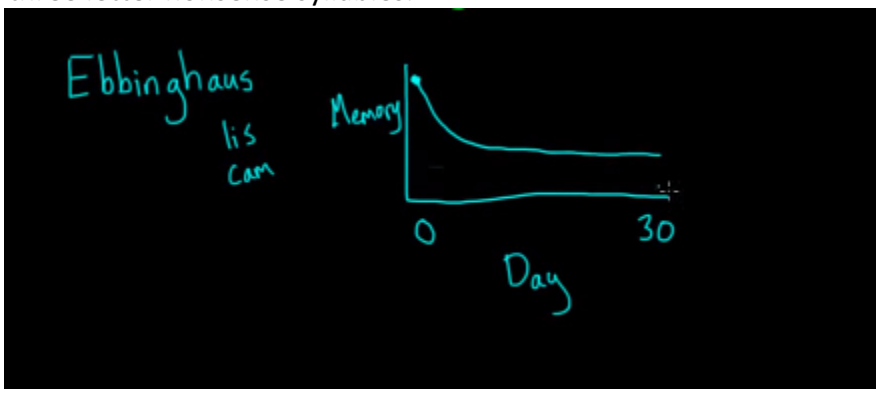
- Brain doesn't grow new cells to store memories – connections between neurons strengthen. Called **long-term potentiation (LTP),** one example of synaptic plasticity.
- Neurons communicate using electrochemical signals – through synapse. Pre-synaptic neurons release neurotransmitters on post-synaptic neurons, allowing Na+ and Ca2+ to flow in.
    - Neural transmission will flow from the presynaptic to the postsynaptic neuron.
- Different in charge between outside and inside is the **potential.**
- With repeated stimulation, the same pre-synaptic neuron stimulation converts into greater post-synaptic neuron potential– stronger synapse, and when it lasts long time it is called **long-term potentiation**. This is how learning occurs!
- In LTP, the same presynaptic stimulation will elicit a stronger and stronger response in the postsynaptic neuron. This mechanism is what allows for facilitated recollection.
    - In this mechanism, equal levels of presynaptic stimulation result in greater postsynaptic potential
    - The greater the postsynaptic potential, the more ion channels will open in the neuron. This will result in a stronger neural response.
- **Neural Plasticity** – changes in brain size/ and involves function of environmental influences

Decay and Interference

- **Decay** – One reason forgetting happens. When we don't encode something well or don't retrieve it for a while, we can't recall it anymore. One theory is that the pathway between cue and memory become weaker over time or periods of disuse which makes

it harder to stimulate those neurons. If you learn something once and never revisit, it is likely to decay over time. Initial rate of forgetting/decay is high but levels off over time.

- **Ebbinghaus** (German philosopher/psychologist in 1800s) was first person to look at decay in human memory. Found his rate of forgetting very fast, but if he remembered it after initial stage it levelled out. In hs experiment, he memorized three letter nonsense syllables.



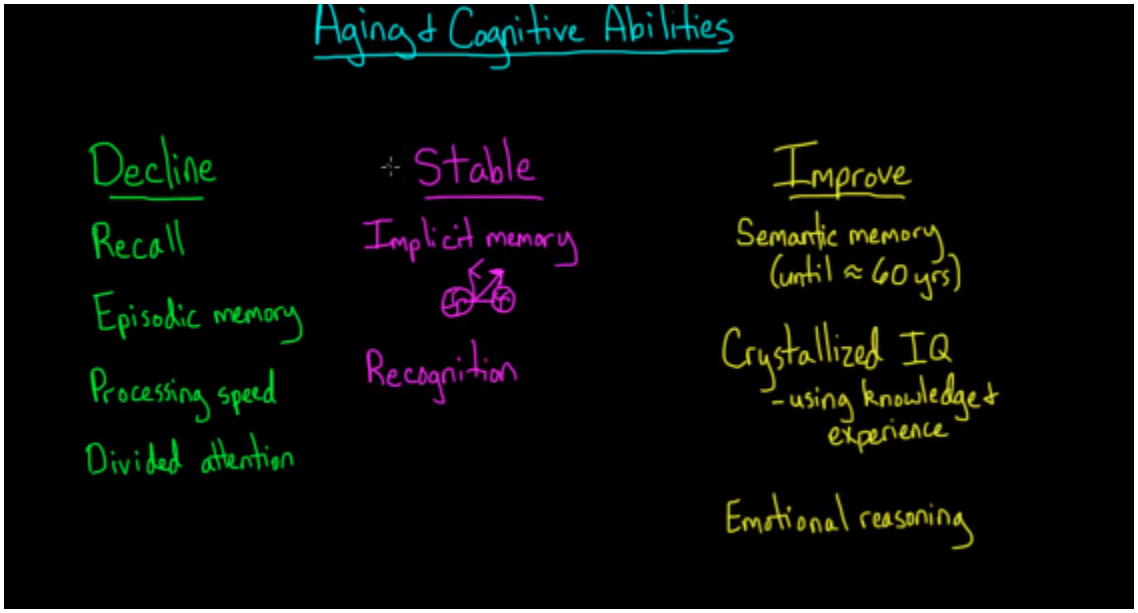
- Later, people replicated this experiment with different patterns and time intervals and found that the more integrated the initial memory, still follows same pattern but it takes a longer time to forget. Most forgetting happens first few days but after that point forgetting will levels out

- Just because you can't retrieve something doesn't mean it's completely gone. One way you can tell if someone has learnt something before is how quickly **relearning** happens. Even if Ebbinghaus couldn't reproduce everything, took less time to learn list second time around. This foundation is called **savings**. This means that some foundation of the memory still existed even if he couldn't produce it.
- Works with procedural skills too – ex. With piano.
- Sometimes **interference** is the problem though – 2 types: retroactive and proactive
  - **Retroactive interference** - new learning impairs old info. Refers to later information interfering with memory for earlier information.
    - ex. Writing new address makes it difficult to recall your old address
  - **Proactive interference** - something you learned in past impairs learning in future. Earlier information interferes with later information.
    - ex. New password learning – prior pw learning impairs ability to learn new one.

Aging and Cognitive Abilities

- Aging is a natural process and with it come changes in memory. Most people associate aging with declines in cognitive performance, but some abilities decline, some remain stable, and some improve.
- **Stable** – implicit memory (aka procedural memories ex. riding a bike), and recognition memory (being able to pick something out of a list)

- **Improve** – semantic memories improve till around age 60, so older adults have better verbal skills (they are great at crossword puzzles!). Also crystallized IQ is improved (ability to use knowledge and experience. Typically tested by analogy tests and reading comprehension). Also better at emotional reasoning.
- **Decline** – recall becomes more difficult (although recognition is stable), episodic memories impaired (forming new episodic memories is difficult, old memories stable), processing speed (older people have a harder time outputting a response), and divided attention (becomes harder to switch attention between task and become easily distracted). Also **prospective memory** (remembering to do things in future) is decreased.



Alzheimer's Disease and Korsakoff syndrome

- Excessive forgetting can be problematic.
- **Dementia** is term for decline in memory and other cognitive functions to the point of interfering with normal daily life – results from excessive damage to brain tissue, ex. From strokes or other causes.
    - Most common form is **Alzheimer's Disease** (AD). Exact cause unknown. Neurons die off over time and as neurons die off, cerebral cortex shrinks in size.
        - Alzheimer's disease is a progressive brain disorder that affects different aspects of memory over time.
        - Earliest symptoms are memory loss, particularly difficulty to retrieve or decode recent memories.
            - In the early stages of Alzheimer's disease, most patients have difficulty remembering the name of a person they just met.(loss of short term memory)
            - In early stages of Alzheimer's disease, most patients with Alzheimer's can still remember details about their childhood,

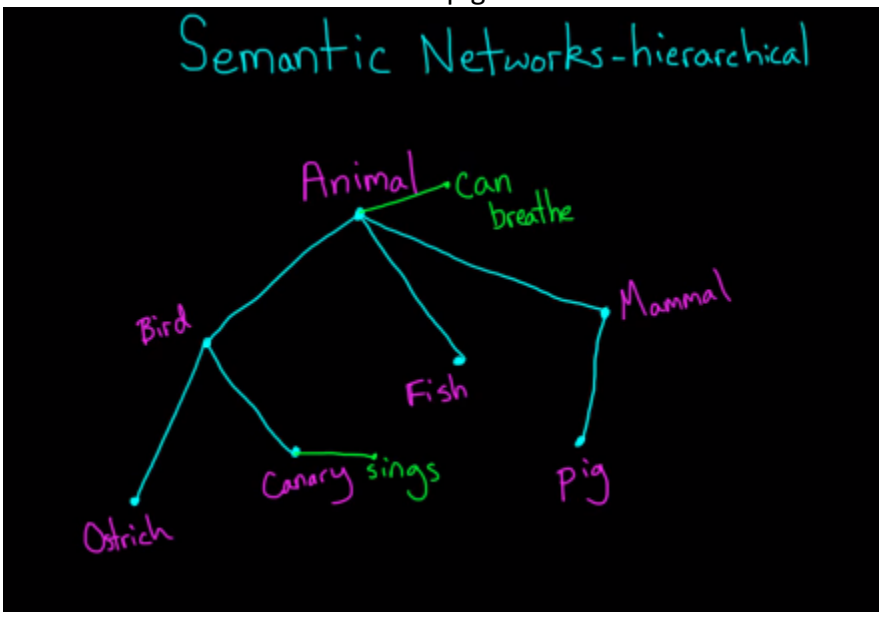
most patients can still remember how to use objects, most patients can still remember general information that they've learned throughout their life.(procedural memory (implicit memory on how to do things), episodic memory (explicit memory about events), semantic memory(explicit memory about words)

    - Other symptoms are difficulties with: attention, planning, semantic memory, and abstract thinking. As it progresses, more severe language difficulties appear and greater memory loss, such as inability to recognize close family and friends.
        - They initially have trouble with short term memory, which eventually progresses into problems with long-term memory (like episodic, procedural, and semantic memory loss).
    - Continual progression might lead to: emotional instability and loss of control over bodily functions.
    - Cause is unknown and diseases is terminal
    - Buildup of **amyloid plaques** in brain.
- **Korsakoff's Syndrome** – caused by ***lack of vitamin B1 or thiamine***. Caused by malnutrition, eating disorders, and especially alcoholism. These groups don't process or absorb all the nutrients they need.
    - Most cases Not caused by brain injuries
    - **Thiamine** is important because converts carbohydrates into glucose cells need for energy. Important for normal functioning of neurons.
    - At first, damage to certain areas causes poor balance, abnormal eye movements, mild confusion, and/or memory loss. At this stage called **Wernicke's encephalopathy** – precursor to Korsakoff's syndrome. If Wernicke's encephalopathy is diagnosed in time it can reverse the damage or at least prevent further damage. If untreated, will progress to Korsakoff's Syndrome, which has a main symptom of severe memory loss, accompanied by confabulation (patients make up stories, sometimes to fill in memories).
    - Korsakoff's syndrome is not progressive, unlike AD. If people are diagnosed and treated, they can better.
    - Treatment typically includes thiamine injections, staying on a healthy diet, abstain from alcohol, take vitamins, and relearn things. Effectiveness depends on how well patient follows the treatment guidelines and how early it is diagnosed.
    - Individuals with Korsakoff syndrome have problem forming new memories and recalling old memories.(anterograde and retrograde amnesia respectively)
- **Retrograde amnesia** is inability to recall info previously encoded, **anterograde amnesia** is inability to encode new memories.
- **Amnesia** - (from Greek, meaning "forgetfulness"; from ἀ- *(a-)*, meaning "without", and μνήσις *(mnesis)*, meaning "memory"), also known as **amnesic syndrome**, is a deficit in memory caused by brain damage, disease, or psychological trauma. Amnesia can also be caused temporarily by the use of various sedatives and hypnotic drugs. Essentially,

amnesia is loss of memory. The memory can be either wholly or partially lost due to the extent of damage that was caused.
    - Amnesia is referred to any instance in which memories stored in the long-term memory are completely or partially forgotten, usually due to brain injury
    - Medial temporal lobe injury
- Retrograde memory: refers to ability to remember experiences before a brain injury (Retro = before)
- Anterograde memory: refers to ability to form long-term memories after brain injury

Semantic Networks and Spreading Activation

- **Semantic Networks**: Concepts are organized in your mind as connected ideas. For closely related ideas, they might be closer and longer for less closely related ideas.
- **Hierarchical Semantic Network**: First semantic network theory suggested that we stored information in a **hierarchical** way. "We store things in a hierarchical manner". It was thought concepts were organized from higher order categories to lower order categories. We store information at the highest category possible. Broad categories/characteristics are stored at higher level nodes.
    - Supported by **Cognitive Economy Principle**: Says that our brain is efficient.
    - **Evidence**: How long it takes people to verify certain statements. For example, it takes people little time to verify a canary is canary, more time to verify canary is a bird, and even more to verify canary is an animal.
        - Longer the distance between nodes or more notes in between = longer it takes to verify the connection.
        - Problem: But, not true for all categories. People tend to categorize a pig as an animal faster than a pig is a mammal.

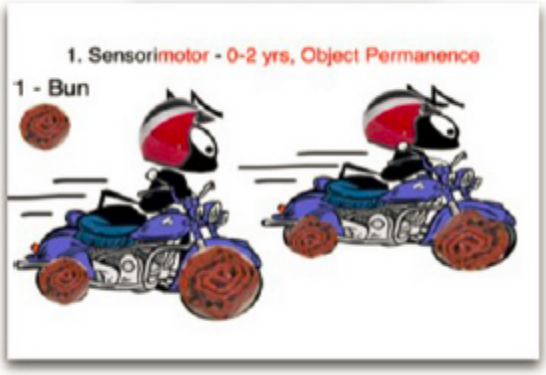


- **Modified Semantic Network:** every individual semantic network develops based on experience and knowledge. Some links might be shorter/longer for different individuals and there may be direct links for higher order categories to exemplars.
    - **Spreading activation:** Says all ideas in your brain are connected together. Pulling up one memory pulls up others as well.
        - **Example:** saying fire engine activates truck, fire, red which makes it easier to identify/retrieve those items.
- Node link strength is a function of exposure. Increased exposure increases node link strength.
- The relative strength of the node links determines the amount of activation emitted to a network or a specific node.
- Stronger nodal links decrease processing time.
- Learning reduces processing time.

Cognition

Piaget's Stages of Cognitive Development

- **Piaget** argued children weren't miniature adults. Believed they actively construct their understanding of world as they grow. As their bodies grow, their minds grow as well.
- **Piaget's Stages of Development –** Acronym: 1 is bun, 2 is shoe, 3 Is tree, 4 is door
    - **Stage 1:** 0-2 years old – **Sensorimotor Stage** (sensory = senses – children gather information about the world via sight, smell, taste, hearing, touch etc. + motor = active, as you develop how to use senses you learn to move your body around). Main task/awareness develops is **object permanence**: objects exist even if they can't see them.
        - Infant's on the other hand don't realize objects still exist if they can't see them (they have not developed object permanence). Ex: if you take a ball away from an infant, they will stop looking for it. This is also why they love peek-a-boo.
        - Sensorimotor stage involves issues such as object permanence and stranger anxiety.
        - **Acronym: Stage 1** – "1 is a bun" and **SensoriMotor**: use the "motor" part of sensorimotor and picture 4 cinnamon buns in place of the wheels on the motorcycle. To remember that object permanence occurs in this stage, use "two ants" for "permanence" and picture two ants riding two motorcycles.

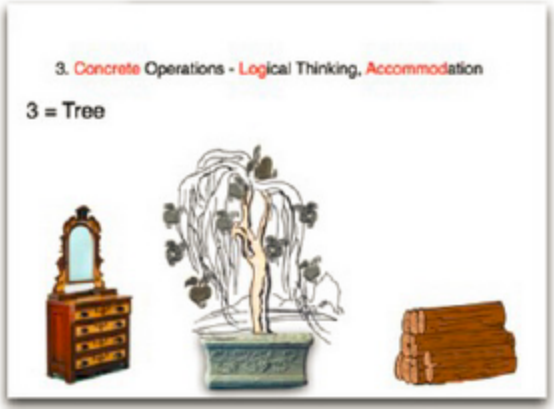


- **Stage 2:** 2-6/7 years old (approx.) – **Preoperational stage** (operational = mental operations like imagining things") - When children are going to develop/engage in **pretend play**. Start to use symbols to represent things. Words symbolize objects and children start understanding symbols. Also, very **egocentric** – only concerned about themselves, no empathy (they don't understand that other people have a different point of view than they do) (ex. A child might not understand that sitting in front of you while you watch TV will prevent you from seeing TV, since they can see). Stage of "I can't see you, you can't see me"
  - The preoperational stage is associated with an inability to understand the perspective of others.
  - **Acronym: Stage 2** – "2 is a shoe" and **Preoperational**: use "preacher" and imagine him wearing outrageously ugly or funny shoes. For magical thinking, which is typical of this stage, picture a rabbit coming out of the preacher's hat. To remember that the conservation tasks are a challenge during this stage, picture Smokey the Bear also wearing ridiculous shoes. To remember that assimilation also occurs in this stage, picture an ass (donkey) with those same shoes.

- **Stage 3:** 7-11 years old– **Concrete operational** "(operational = mental operations". Learn idea of **conservation**.
  - Can do test to find out if they're in this stage – take 2 identical glasses with same amount of water, and kids will tell you they have the same

amount. Then, pour one into short fat glass and other into tall skinny glass in front of the child and ask child which one has more. Before this stage will say tall glass, because the water is higher, but once they reach concrete operational stage and understand amount of water doesn't change just because the glass size changes then they will tell you that they have the same amount of water even though they look different. Also begin to learn **empathy**; begin reasoning of **math skills.**

- The concrete operational stage describes children who are able to grasp concrete (real) events logically, conversion, and reversibility (refers to the ability to recognize that numbers or objects can be changed and returned to their original condition.
- Acronym: 7-11 (the store) kids sell Big Slurpee's
- No hypothetical reasoning (mastered in next stage)
- **Acronym: Stage 3** – "3 is a tree" and **Concrete Operations**: picture a tree with concrete leaves and the tree is growing out of a concrete pot. Next to the tree is a pile of logs (for logical thinking) and next to the tree is a wooden commode (for accommodation).



- **Stage 4:** 12+ years old - **Formal operational stage** – reason **abstract** consequences, and reason consequences; **moral reasoning.** At this point children are reasoning more like adults and they continue to develop that overtime.
  - In the formal operational stage, a child will be able to think logically about abstract ideas, hypothetical situations, and use abstract thinking to solve novel problems.
  - **Acronym: Stage 4** – "4 is a door" and **Formal Operations**: picture a very wide door and behind that door are "four males" with excellent abs (for abstract thinking, which is possible at this stage).

- Later, developmentalists have come and figured out that children don't necessarily develop these abilities in certain age brackets, but they do tend to progress in a predictable fashion and thanks to Piaget now we know that children are more than just miniature adults.

Schemas, Assimilation and Accommodation

- Piaget, all of us including young children are trying to understand/make sense of the world around us via schemas.
- **Schemas** – mental models – Frameworks for us organize and interpret new information. Piaget belief of cognitive development was in the development of schemas. To develop these, you need to be able to grow/change them – which happens through assimilation and accommodations.
    - **Assimilation** – how we describe new information/experiences in terms of our current understanding/schemas. Acronym: assimilation has "ss" – same schema
    - **Accommodation** – how we later adjust our schemas to incorporate new experiences –to remember. Acronym: accommodation has "cc" for change or create
    - Example given in video – imagine a box (our schema) with 3 holes that fits 3 different shapes – circle, triangle, square. They all fit perfectly. But what if we have a star. We can either make another star shaped hole in our box for the star to fit to assimilate it OR we accommodate by making a whole new schema for it
- Development moves along in a state of equilibrium as we assimilate and/or accommodate new info we come across. Most information we encounter, we can assimilate and be back at a state of equilibrium. Information → assimilation → equilibrium. But, sometimes assimilation can't cause us to come into equilibrium and we engage in accommodation when the information we receive cannot be assimilated (information → accommodation → equilibrium) to reach equilibrium again. You gain a new schema.

Problem Solving

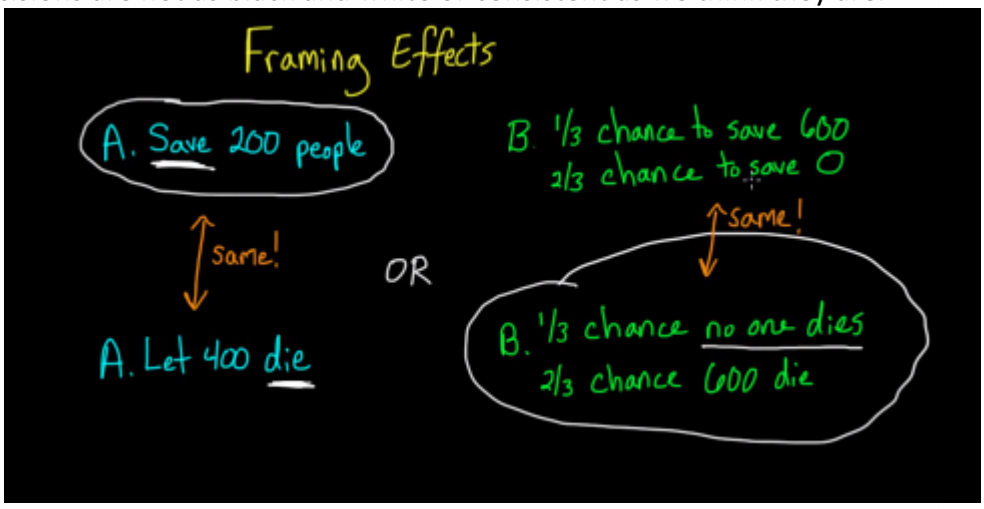
- Examples of problems: how do you decide who to marry, best route to your new job, how do you satisfy your growling stomach
- Problem Solving: moving from a current state to a goal state. This is called solving a problem.
    - Can be something as simple as starting a YouTube video
- We are excellent problem solvers.
- Problems can be broken down into two categories: Well defined and Ill defined.
    - **Well-defined** Problems: clear starting and ending point. A well-defined problem has clear criteria that describe whether or not the goal has been achieved.– ex. how to turn light that is currently dark
- **Ill-defined** - More ambiguous starting and/or ending point. An ill-defined problem does not have an obviously stated goal or lacks relevant information to solve the problem.
    - ex. how to live a happy life. Can still solve ill-defined problems solve but don't know outcome.
- **Methods of Problem Solving:**
    - **Trial + error –** take random guesses till something finally work. **Not efficient. Ex.** like trying to remember passwords for email you haven't accessed in a while. Know PW is 8 characters but don't remember what it is. If you are trying trial/error you guess any random combination and you don't even keep track of what you have already guessed. You could get lucky and hit pw early or it could take a long time.
    - **Algorithm** – methodical approach. A logical step-by-step procedure of trying solutions till you hit the right one. Not efficient, but are guaranteed to find the correct solution eventually. Ex. Methodically approach all possible solutions of 8 Character PW.
    - **Heuristics** – mental shortcut that allows us to find solution quicker than other 2, Reduces the # of solutions we need to try by taking an approach as to what possibilities could exist and eliminates trying unlikely possibilities. Don't guarantee a correct solution, but they do simply complex problems and reduce total # of solutions we will try in order to get to a more manageable #. Ex. Focusing on one category of solutions OR guessing a PW that contains your birthday.
        - **Means-end analysis** –a heuristic where we analyze main problem and break it down into smaller problems. We then attack the problem that has the most difference between current state and goal state. Solve Biggest → Smallest Problem. Current State → Goal State. Ex. Planning a trip to a new country, biggest problem would be to get to the new country – so you book a plane ticket to a new country.
        - **Working backwards** – Goal State → Current State. Start with goal and use it to suggest connections back to current state. Used in mathematical proofs, in mazes.

    - **Intuition** – relying on instinct. High chance of error.
- **Fixation** – Getting stuck on a wrong approach to a problem.
    - If we can start solving the problem, it typically occurs through an **insight** – that aha moment. Insight is hard to predict and hard to encourage, particularly when you are fixated on seeing a problem from the same inefficient approach.
- Or we can let problem **incubate** – insight comes after some time.
- **Type I error** = false positive**, type II error** = false negative

Decision Making

- **Decision making**: We make a judgement of the desirability/probability of a certain outcome
- You use **heuristic** – a mental shortcut to make a decision, a quick decision rule/rule of thumb. Lots of kinds of heuristics used for decision making. Help us make decisions.
    - Ex.. What has a higher risk- Shark attack vs firework accident?
- **Availability heuristic** – using examples that come to mind. Helpful, but our easily memorable experiences don't match real state of the world.
    - The availability heuristic is a decision making heuristic where choices are based on quick, easily accessible examples.
    - Ex. More shark attacks on news so you think a shark attack = more fatal. But, firework accidents are more fatal (have a higher risk) but are less available (less publicized).
- **Representativeness heuristic**– a heuristic where people look for the most representative answer, and look to match prototype – a given concept to what is typical/representative.
    - Ex: Linda is outspoken and very bright, majored in philosophy and as a student she participated in antinuclear demonstrations and organizations that fought discrimination. What is more likely? Linda is a Feminist bank teller or a bank teller. Most people will say she is more like a feminist bank teller even if they don't know feminists or anyone like Linda. She fits you prototype of how a feminist would act (she is representative of a feminist).
    - Can lead to a **conjunction fallacy**: which means co-occurrence of two instances is more likely than a single one. People tend to think the probability of 2 events occurring together is higher than the probability of one alone (ex. Linda being a bank teller and feminist is greater than just being a bank teller. However statistically speaking there are more bank tellers than feminist bank tellers so it's more likely she is just a bank teller than a feminist + bank teller, which your instincts might be telling you).
    - When a decision's probability is judged based on how similar or representative the aspect is to a specific person, group, or population and the degree that it reflects the features of the population as a whole, this is described as the use of a **representativeness heuristic**.
- Availability vs. representativeness heuristic:

    - availability = actual memories in mind,
    - representativeness = not thinking of exact memories, thinking of a prototype of idea (general typical concept)
- Anchoring-and-adjustment heuristic requires a person to create a set point or anchor. The answer is adjusted based on comparing new information to the anchor
- **Biases** that prevent us from making correct decision or from changing decisions once they are made
    - 1. **Overconfidence** – ex. Going into test without knowing a lot of info. Could be due to fluency (ease of processing) during studying. Ex. Can happen in a test if you never tested yourself to see if you really knew the answers. Can overestimate ability to produce answers when you need too. Can also experience overconfidence in an argument.
    - 2. **Belief perseverance** – ignore/rationalize disconfirming facts, ex. During elections learned about and then ignore facts about someone you like.
    - 3. **Confirmation bias** – actively seek out only confirming facts. Ex. Only read stories about how wonderful candidate was.
- **Framing effects** – how you present the decision can affect decisions as well.
    - Ex. Disease that will kill 600 people, option A is 100% chance exactly 200 people saved, option B 30% chance all 600 saved and 2/3rd chance 0 will be saved. Which option do you pick? OR A. 100% chance 400 die B. 1/3 chance no one dies and 2/3 chance 600 die.
    - In first example, most people will pick A. In second, most pick B.
    - If choice is framed based on how many people will be saved, you more likely pick it. If choice framed based on how many people die and have an option that no one dies. You chose an option based on how its framed despite the choices being the exact same.
- These factors that impact decisions (heuristics, biases, and framing) show us that our decisions are not as black and white or consistent as we think they are.



Semantic Networks and Spreading Activation

- To solve problems, you have to access info already in your brain.
- **Semantic Networks** - concepts are organized in mind in terms of connected ideas. Parallel to how info might be stored in a computer. Links can be shorter for closely related ideas, or longer for less related ideas. Concepts are represented by nodes.
- First semantic network model was **hierarchical** – higher order to lower order categories.
    - Ex. Animal -> bird -> ostrich.
    - More specific characteristics like sings, long legs, stored at lower nodes. Can breathe at higher nodes.
    - Longer it takes us to verify connection between nodes longer it takes for us to make that link.
- Not true for all animals/categories, ex. People verify pig is animal takes longer than pig is mammal. Therefore proposed **modified semantic network.**
    - Rather than hierarchical, says every individual semantic network develops based on experience and knowledge.
    - Means all ideas in head are connected together. When you activate one concept, you pull related concepts with it. Called **spreading activation**. (Can explain false memories, or remembering wrong but related info).

Intelligence

- IQ is Intelligence Quotient.
- What is intelligence? A mental quality that allows you to learn from experience, solve problems, and use your knowledge to adapt to new situations. Intelligence tests use numerical scores to measure aptitude for those tasks and compare them to how well others do.
- One theory is there's **1 general intelligence. - Spearman**
    - Evidence comes from fact people who score well on one test also tend to score well on other types of test, ex. Verbal and math skills. relative to other people, you tend to equal in both skills, although relative to oneself they might be different
    - Factor underlying these consistent abilities is called **g factor** (acronym: g = general intelligence)
- Also support for theories of multiple intelligences. **3 types of intelligences – analytical intelligence** (Academic abilities – to solve well defined problems), **creative intelligence** (ability to adapt to new situations and generate novel ideas and adapt) and **practical intelligence** (solve ill-defined problems, such as how to get a bookcase up a curvy staircase) – proposed by Robert Sternburg.
    - IQ score measures only analytical intelligence. Scales are scored so average person score is 100. Depending on where you are in relation to 100 – it effects where you are at large.
    - Standard Deviation = 15.
    - High analytical intelligence = tend to do better at school.

    - Those who have high IQ, creative, and/or practical intelligence do not tend to have better marriages, achieve greater physical/mental wellbeing/raise their kids better
- Another psychologist proposed **emotional intelligence** –perceive, understand, and manage and use emotions in interactions with others.
- Another way to look at intelligence is in 2 major categories – **fluid and crystallized intelligence**.
    - **Fluid Intelligence** - is ability to reason quickly and abstractly, such as when solving novel logic problems.
        - fluid intelligence is the ability to think on one's feet, be adaptable, and solve problems using deductive and inductive reasoning.
        - Cattell defined fluid intelligence as: in novel situations, the ability to recognize and reason relationships between objects or ideas independent of previous experience.
        - Fluid intelligence helps one see patterns, organize and identify feature and spatial relationships to solve complex problems.
    - **Crystallized Intelligence** - refers to accumulated knowledge and verbal skills.
        - Fluid intelligence tends to decrease as we move into older adulthood, while crystalized increases or stays same.
        - Cattell defined crystallized intelligence as the ability to retrieve and acquire knowledge
        - Crystallized intelligence is based on fact, experience, prior learning and accumulates as one ages.
- **Alfred** –**Binet** – First to develop an intelligence test, but wasn't intending too. He developed a test in order to establish a child's mental age and measure a child's intellectual development and predict how well they will do in school later on. Was designed for French children
- **Lewis Terman,** a Psychologist of Stanford University furthered/modified Binet's Intelligence test and also incorporated teenagers and adults. This was named the **Stanford-Binet Intelligence Test**. Terman noted that Binet's test was not predictive of US children. The Stanford-Binet test started being used to measure intelligence of immigrants (which was a huge problem –the test tested language ability which presented a clear issue, a language barrier)
    - Now, intelligence tests are being designed to make them more applicable to all cultures.
- Question of **nature vs. nurture**. How much is intelligence due to genes and how much due to environment/experiences.
    - Study heritability by looking at correlation scores of twins who grew up in different homes, identical twins raised together, and fraternal twins raised together.
    - What we know is of 3 groups, strongest correlation between IQ scores in identical twins raised in same homes. Raised apart not as high correlation (there

is some environmental component). Fraternal twins raised together show lower correlation, suggesting also a genetic component.
    - Nature and Nurture contribute to intelligence
- No recipe for structuring environment to make a genius, even though we know environments that would impair intelligence (cognitive functioning). When children are deprived of interaction with people or language – intelligence is impaired; however, no direct correlation. Exposure is better than no exposure, but tons of exposure doesn't lead to a genius.
- Attitude towards intelligence is important perhaps. Some people have a **fixed mindset** (intelligence is biologically set and unchanging), and others have **growth mindset** (intelligence is changeable if you learn more). Those with growth mindset accomplish more in careers.
    - Fixed Mindset: Praise that reinforces a fixed mindset describes characteristics and actions as innate and unchangeable.
    - A growth mindset praises effort, perseverance, improvement, and strategies rather than the end result. Eg. "You worked really hard on your assignment"
- **Galton's idea of hereditary genius** – human ability is hereditary
- **Binet's idea of mental age** – how a child at a specific age performs intellectually compared to average intellectual performance for that physical age in years.
- **Convergent intelligence** was proposed by Guilford to describe IQ test related intelligence, such as puzzles, vocabulary words, and arithmetic.

Theories of Intelligence

- Many theories on what intelligence is and how to define it.
- Debate: Is there one intelligence or multiple intelligences (intelligence has multiple aspects)
- Theories of Intelligence: [Acronym: ST[A]G[E]S of Intelligence – Spearman, Thurnstone, Gardner, Sternberg. In order from General (1) → Multiple Mental Abilities (7) to Multiple Intelligence 7-9, to Triarchic Multiple Intelligence (revamped Multiple Intelligence to 3)]
    - Theory of General Intelligence
        - Theorist:
            - Charles Spearman
        - Summary:
            - Used factor analysis to identify cluster of related abilities
            - 1 general intelligence
            - g factor – can predict our intelligence in multiple academic areas
        - Strength/Evidence:
            - Theory highly supported by research.
            - Those who score high in one area also score highly in other areas.
            - Ex. scoring high in verbal intelligence correlated to high special reasoning.

        - Problems:
            - Controversial
            - Can one factor explain all of the diverse human abilities?
            - Limited in what it considers to be intelligence.
    - Theory of Primary Mental Abilities
        - Theorist:
            - L.L. Thurnstone
        - Summary:
            - 7 factors of intelligence: word fluency, verbal comprehension, spatial reasoning, perceptual speed, numerical ability, inductive reasoning, and memory.
        - Strength/Evidence:
            - Breakdown seems intuitive
            - Ex. Possible to have high inductive skills w/o high verbal comprehension
        - Problems:
            - How can scores vary together statistically (suggests underlying intelligence factor)?
            - Limited in what it considers to be intelligence.
    - Theory of Multiple Intelligence
        - Theorist:
            - Howard Gardner
        - Summary:
            - Expanded ideas of what can be included in intelligence.
            - Gardner divided into 7 then 9 independent intelligence (they don't depend on each other and hence intelligence in 1 area does not predict intelligence in another);
            - logical-mathematical intelligence, verbal-linguistic, spatial-visual, bodily-kinesthetic, interpersonal, intrapersonal, musical. Later 2 added: naturalist, and existential intelligence.
        - Strength/Evidence:
            - You can have different strengths independently.
            - Intelligence is more than just "book smarts."
        - Problems:
            - No way to test this theory (not supported by research).
            - Intelligence vs. talents/abilities (but maybe this is just a labeling)
    - Triarchic Theory of Intelligence
        - Theorist:
            - Robert Sternberg
        - Summary:
            - 3 independent intelligences

        - based on real world success: analytical (problem solving ability), creative intelligence, and practical intelligence.
    - Strength/Evidence:
        - Reliable, easy to study by research.
    - Problems:
        - Research shows that scores of all intelligences vary together.
        - Are these 3 sides of the same coin?
- Research suggests there is only 1 general intelligence.
    - Does the word intelligence even hold meaning? Everything doesn't need to be an intelligence. Maybe intelligence doesn't hold meaning. It doesn't matter if the musicians are labeled as having a "high musical talent/ability" or a "high musical intelligence" – it is still wonderful to listen to.
    - Perhaps there is just one general underlying intelligence just like one general athleticism. Varying parts of athleticism can vary, but people who tend to be good at one sport tend to be good at another. Same can be true of intelligence.

Aging and Cognitive Abilities

Cognitive **Declines** as you age	Cog. **Stable** as you age	Cognitive **Improvements**
-Recall -Episodic memory -Processing speed -Divided Attention	-Implicit Memory (riding bike) -Recognition memory	-Semantic memory (improves until 60years) (verbal skills) -Crystallized intelligence (use knowledge and experience) (using reading comprehension to test) -Emotional reasoning

Language

Language and the Brain: Aphasia and Split-Brain Patients

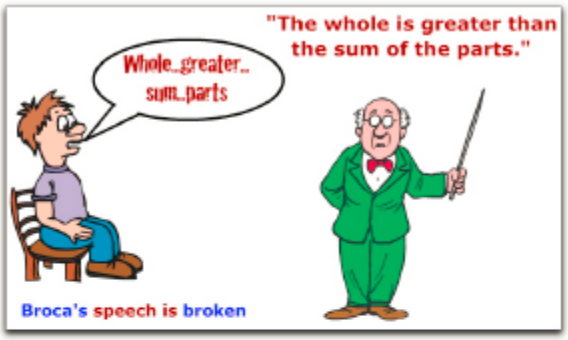
- Language is divided into many sub functions. How your brain speaks and understands language.
- 90% of people, language is in **left** hemisphere (both right and left handed people!). Whatever is dominant, 2 main areas are **Broca's area** (speak/language expression, frontal lobe) and **Wernicke's area** (temporal lobe (sound processing), understand)
- **Aphasia**: disorder that involves language. Aphasia is a communication disorder that causes problems with language, like speaking, listening reading, and writing.
    - When Broca's is damaged, people have trouble producing speech. **Broca's aphasia** (also called **non-fluent aphasia**). Acronym: Broca's aphasia = Broken

speech. Damage to the language production centers of the brain. Produce broken/halted speech. Frontal lobe region damaged.

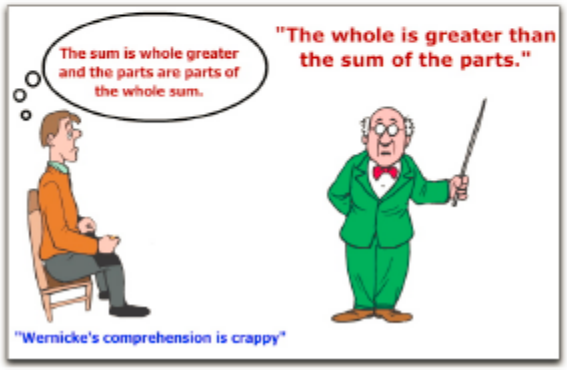
- Broca's aphasia is characterized by apraxia, a disorder of motor planning, which causes problems producing speech.

- **Wernicke's aphasia** (also called **fluent aphasia /receptive aphasia**) - is different pattern of behavior – words they make don't make any sense. They also can't understand what others say. Temporal lobe region damaged.
  - Wernicke's aphasia is characterized by difficulty understanding spoken words and sentences, as well as difficulty producing sentences that make sense.
  - Persons with Wernicke's aphasia can produce many words and they often speak using grammatically correct sentences with normal rate and prosody. However, often what they say doesn't make a lot of sense or they pepper their sentences with non-existent or irrelevant words. They may fail to realize that they are using the wrong words or using a non-existent word and often they are not fully aware that what they say doesn't make sense.
  - "Word Salad" = lacking meaning of produced speech which is normal (prosody)
- **Broca's Aphasia** and **Wernicke's Aphasia** are the most common.

Broca's area: Broca's area is the area of the brain responsible for producing speech. If it is damaged, you can understand what someone says, but your speech is disjointed. In other words, "Broca's speech is broken" or "Broca's banter is broken".



Wernicke's area: Wernicke's area is responsible for the comprehension of speech. If you have an aphasia in this area of the brain you are unable to understand and respond to what people are saying to you. In other words, "Wernicke's comprehension is crappy".


"The whole is greater than the sum of the parts."
The sum is whole greater and the parts are parts of the whole sum.
"Wernicke's comprehension is crappy"

- **Global Aphasia -** Both Broca's Aphasia and Wernicke's aphasia are damaged**.** Acronym: Globally affects language.
    - Global aphasia is a combination of impaired comprehension and production of speech.
- 2 areas (Wernicke's and Broca's) are connected by a bundle of nerve areas are connected by bundle of nerves fibers called the **arcuate fasciculus**, also found in deaf people who know sign language. Not specific to spoken language, but brain adapts to whatever modality is needed for communication.
- When this is damaged, **conduction aphasia** (also called **associative** aphasia) – ability to conduct between listening and speaking is disrupted. Makes it difficult for people with this to repeat things even when they understand what is being said. Associated with damage to the arcuate fasciculus.

- Lots of other types of communication which have their own equivalents to aphasia.
    - **Agraphia** - inability to write. Acronym: G think Gel pen.
    - **Anomia** /anomic aphasia- inability to name things Acronym: n = Think Name or prefix "anom-aly"
        - **Anomic aphasia is characterized by problems difficulties in naming objects or in retrieving words.**
    - Other loss of communication including inability reading, spelling, grammar, pronunciation
- Language is example of big tasks broken into small tasks, spread into other parts of brain. Good thing because if you have localized brain damage, won't completely lose everything. When functions are divided, easier for brain to adapt – ex. When stroke affects left hemisphere, and can't speak, over time with therapy some can retrain other speech-related parts of brain by creating new connections between neurons– **neural/synaptic plasticity.** Some original parts can sometimes recover. Both of these effects combined can help people speak again with some degree of fluency.
- With perfectly functioning hemispheres, you might have trouble naming objects. This can occur if the connection between hemispheres is severed (if you sever the **corpus callosum** – which is a thick band of nerve fibers which connects the two hemispheres). This disrupts communication. Creates a **split-brain patient** – a patient with two part of the brain not connected. This used to be done for a treatment for seizures, but the side defect was with language.
- Brain has **contralateral** organization: left visual field info gets proceed by right side and vice versa.
- If you see an object and it gets sent to your left, it is sent to your right hemisphere. You won't be able to name it because the right hemisphere information can't communicate with the left hemisphere language parts. You would be able to pick up the object however since your right hemisphere controls your left body movements. However, if the object was in your right visual field, you would be able to process it.

Left Brain	Right Brain
Logical	Random
Sequential	Intuitive
Rational	Holistic
Analytical	Synthesizing
Objective	Subjective
Looks at parts	Looks at wholes

    - Left side needed for language, right side needed for action/perception/attention.
    - If you see object on left, won't be able to name it. Can pick it up with left hand (since right side controls left), but has to be in right visual field before brain can name it.
    - Ex. showing colors on left side of visual field, information is sent to right hemisphere, which is responsible for perception/attention, but can't speak it, because left brain is needed for language. s
- Prosody – located on right hemisphere. Concerned with larger units of speech like syllables. Contribute to linguistic functions such as intonation, tone, stress, and rhythm. Prosody may reflect various features of the speaker or the utterance: the emotional state of the speaker; the form of the utterance (statement, question, or command); the presence of irony or sarcasm; emphasis, contrast, and focus; or other elements of language that may not be encoded by grammar or by choice of vocabulary.

Theories of Language and Cognition

- Does having different words for color mean that you think about color differently? There is a country in New Guinea that has only two words for color "mola" meaning dark and "mili" meaning light while the US has lots of words for color.
- Behaviourists– empiricist, believe language is just conditioned behavior. Nativists – rationalist, language must be innate. Materialist – look at what happens in brain when people think/speak/write.
- Some languages only have 2 words for color. But does that mean we think about color differently? Great language debate. Not sure which is the correct one.
    - Linguistic universals theory states that there are characteristics that remain consistent across all languages of different cultures.
    - **Universalism** - thought determines language completely. Your thought dictates language.
        - A Universalist believes that human cognition shapes language and language is created from a set of universal semantic distinctions and constructions shape human language.

        - Ex: The New Guinea people only think about dark and light. If they had other thoughts, they would develop words for them.
    - **Piaget** – came up w/ cognitive development in children. He believed once children were able to think a certain way, they then developed language to describe those thoughts → influences build it. Language influence is influenced by cognitive development.
        - For example, when children develop object permanents, they start to develop words like gone and missing, find, etc.
        - Although the use of language begins in the sensorimotor stage, Piaget believed that the world of a child in this stage is understood through sensation and action.
        - During the preoperational stage, according to Piaget, the world is understood mainly through the use of language and mental imagery.
        - A child in the concrete operational stage of development will use categories, logic, and concrete reasoning to understand the world.
        - A person will describe and understand the world through scientific reasoning, hypothetical situations, and abstract relationships in the formal operational stage, according to Piaget
    - **Vygotsky** – language and thought are both independent, but converge through development. Eventually learn to use them at same time via *socialization* - Believed children developed language through social interaction with adults who already knew the language. Through the interaction, they learnt to connect the thoughts and the language they eventually learn.
    - **Linguistic Determinism** –Language has an influence on thought. They are called the Weak and Strong hypothesis – referring to ho much influence they think language has on thought.
        - **Weak Linguistic Determinism: (relativism)** language influences thought. It makes it easier/more common for us to think in certain ways based on how our language is structured.
            - Linguistic Relativism - There are differences in language between cultures.
            - Example: The girl pushes the boy. If you imagine that statement with girl on the left, your native language probably reads from left to right like English. If you drew it with the girl on the right, your native language probably reads right to left like Hebrew. Right to left vs. left to right language influences what direction you imagine girl pushing boy.
            - Weak Linguistic Determinism believes linguistic structure influences but does not determine the context of everyday encounters.
        - **Strong Linguistic Determinism** (aka **Sapir-Whorfian hypothesis**): Language determines thought completely. People understand their world

through language, and language in turn shapes how we experience the world.

- Ex. Native tribe called Hopi without grammatical tense in language so they couldn't think about time in same way.
- The linguistic relativity hypothesis (Whorfian) asserts that cognition and perception are determined by language one speaks.
- Whorfian theory believes linguistic structure determines how and about what an individual is able to think.

Theories of Language Development: Nativist, Learning, Interactionist

- Language Development: very complex!
- Neural networking theory states that there are innate language mechanisms that can be activated by experiences.
- **Nativist** (innatist/Biological) **perspective** – children are born with ability to learn language. Associated with **Noam Chomsky**. Thought humans had a **language acquisition device** (LAD) that allowed them to learn language. Idea that this ability exists – all languages shared universal grammar (same basic elements like nouns, verb, etc.) So LAD enables child to pick up on understand/pick up on those types of words and their organization within a sentence for any language.
    - Goes along with idea there's a **"critical period"** (also called **sensitive period**), thought to be from birth to age 8-9, the period of time a child is most able to learn a language. After that, becomes harder because LAD only operates in that critical period. Once you start using it, LAD starts specializing for your language and unable to detect others.
    - **Critical Period/Sensitive period definition**: a point in early development that can have a significant influence on physiological or behavioral functioning in later life.
    - Investigates **Transformationalist Grammar**: refers to the different ways that words can be arranged to convey the same information.
    - Language is an innate ability

- **Learning (Behaviorist) theory** – children aren't born with anything, they only acquire language through operant conditioning. Child learns to say "mama" because every time they say that, mom reinforces child. But doesn't explain how they can produce words they've never heard before or unique sentences. Associated with BF Skinner. Language is learned.
- **Interactionist approach** – Sometimes called social interactionist approach. Believe biological and social factors have to interact in order for children to learn language. Children's desire to communicate with others – such as adults in their life, makes them motivated to learn language. Associated with **Vygotsky**.

KEY CONCEPT

Timeline of language acquisition:

- 9 to 12 months: babbling
- 12 to 18 months: about one word per month
- 18 to 20 months: "explosion of language" and combining words
- 2 to 3 years: longer sentences (3 words or more)
- 5 years: language rules largely mastered

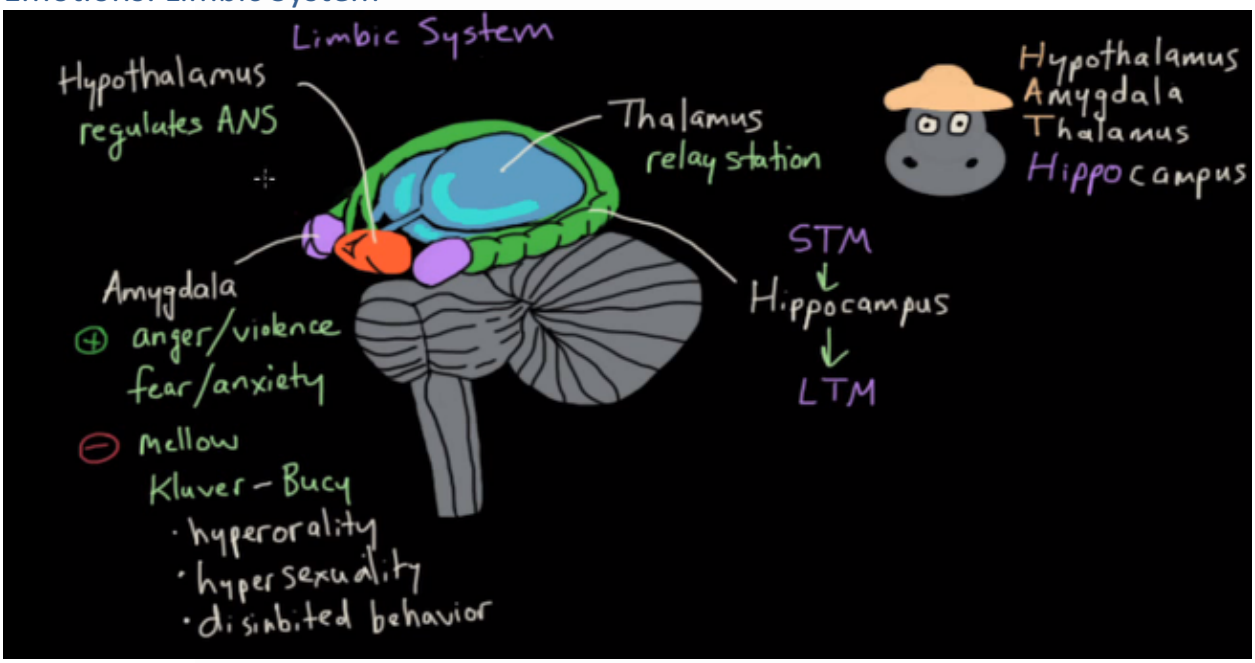
Language Components (not a video)/Other language

- Lexicon - A set of vocabulary items. entire set of morphemes in a language
  - ASL that would mean the total combinations of hand movements, locations, facial expressions, and body language that help them to form meaningful words.
  - **Lexical access** refers to identifying a word and connecting it to its meaning, which has been stored in long-term memory.
- All kids babble
- 5 components:
  - **Phonology**: phonetic component, actual sound of a language. "a sound system"
    - 40 **phonemes** (smallest unit of sound) in English language
    - Distinction between sounds: categorical perception. Children must learn to do this!
      - In ASL - hand movements and locations are analogous to sound in spoken language, they are classified as phonemes (smallest unit of language)
    - Acronym: Phone = sound
  - **Morphology**: refers to the structure of words. Many words are composed of multiple building blocks called morphemes (smallest significant unit of meaning of a word). "A grammatical system, which puts meaningful elements together into 'words'.

        - In ASL, when hand shape and location are combined, they form morphemes.
    - **Semantics**: association of meaning with a word. Semantics are the broad meanings of each word, phrase, sentence, or text. N400 response, bigger with bigger violation.
    - **Syntax**: how words are put together in sentences. Syntax refers to the way words are placed together to form language. Syntax describes how words are arranged to create grammatically correct sentences. P600 response bigger with bigger violation.
        - In ASL, this would mean combining multiple signs, gestures, and body movements to communicate effectively.
        - All languages have some form of syntax.
    - **Pragmatics**: Dependences of language on context and pre-existing knowledge.
        - Pragmatics are affected by **prosody** – the rhythm, cadence, and inflection of our voices.
    - Although all animal species communicate through some form of language, as far as we know, human language is unique.
    - The ease with which a culture learns a language is impacted greatly by the complexity of the language's syntax and semantics.

Emotion

Emotions: Limbic System



- **Limbic System:** A set of structures in the brain, and many structures play an important role in regulating emotions. Experts can't agree on what structures make up the entire limbic system.
- Responsible for storage/retrieval of memories, especially ones tied to emotions.
- Structures of the limbic system: Acronym: hippo wearing a **HAT (HAT Hippo**): **H**ypothalamus, **A**mygdala, **T**halamus, and **Hippo**campus.
- **Thalamus** – sensory relay station, everything you hear/taste/etc. Senses come through your nerves and end up in thalamus, which directs them to appropriate areas in cortex, and other areas of the brain. Emotions contingent on senses. Smell is only one that bypasses the thalamus – goes to areas closer to amygdala.
- **Amygdala** – aka aggression center. If you stimulate amygdala, produces anger/violence and fear/anxiety.
    - If you destroy it, get mellowing effect. **Kluver-Bucy syndrome** – bilateral destruction (destruction of both) of amygdala can result in hyperorality (put things in mouth a lot), hypersexuality, and disinhibited behaviour. These are all drunken behaviours. Damaged amygdala → patients given Benzos (acts like alc.). Those who have anxiety, whom are given Benzos, and you see these behaviors.
- **Hippocampus** – key role in forming new memories. Convert STM (Short term memory)→ LTM (long term memory). If destroyed, still have old memories intact, just can't make new ones (**anterograde amnesia**).
- **Hypothalamus** (hypo – below, thalamus, tiny structure) – for limbic system, it regulates the Autonomic nervous system (ANS) - (fight or flight vs. rest and digest). Controlling endocrine system by triggers hormones like epinephrine/norepinephrine.; responsible for hunger, sleep, thirst, sex

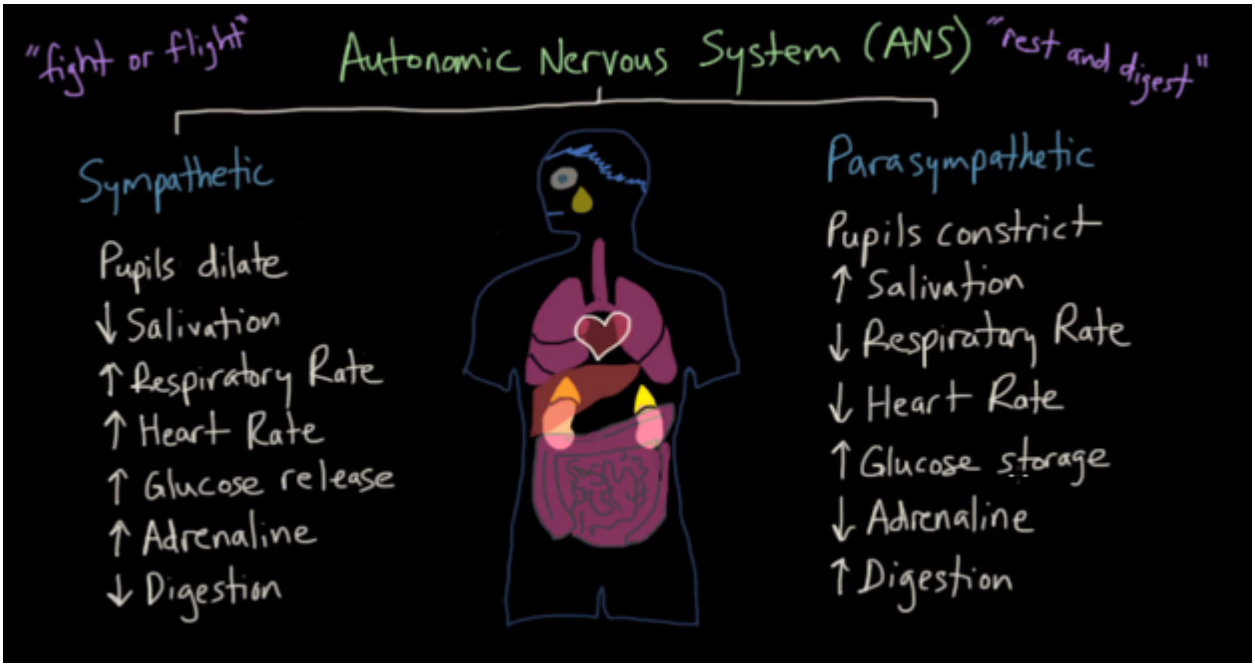
Emotions: Cerebral Hemispheres and Prefrontal Cortex

- Role of cerebral cortex in emotions.
- Cerebral cortex can be divided in many ways. One way is to divide it in terms of hemispheres – Left (L) and Right (R) hemispheres.
    - *Positive emotions* evoke more activity *on left side*, (Acronym: Right handed people are positive, and remember contralateral brain set up)
        - Evidence: Videos of positive emotions = left hemisphere increased activity on EEG. More activity on left.
        - Evidence with children: Little kids playing in group – more social kids had more activity in left hemisphere, and isolated kids more activity in right.
        - More positive, joyful, interest, enthusiastic, cheerful people had more activity in left
    - Negative emotions evoke more activity on right side.
        - Videos of negative emotions = right hemisphere increased activity on EEG. More activity on right.
        - More timid, fearful, depressed had more activity in right
        - Isolative

- Dividing into functional divisions – focus on **prefrontal cortex**
    - Responsible for many higher-order functions, everything that distinguishes humans. Executive control - solve problems, make decisions, how you act in social situations.
    - Undergoes most development from birth
    - Helps manage how you behave in social situations
    - Phineas Gage had iron rod penetrate his prefrontal cortex. After incident, rude and rough, behaved inappropriately.

Autonomic Nervous System (ANS) and Physiological Markers of Emotion

- Physiological changes that occur which aren't under your control due to the Autonomic Nervous System (ANS).
- Has 2 branches – **sympathetic** (fight or flight) and **parasympathetic** (rest and digest). Different actions in your body.
    - Sympathetic: "result due to fear" – effects:
        - pupils dilate (want to be able to see better/bring in more light),
        - Decrease in salivation (nervous when you are doing public speaking)
        - increase respiration rate (more O2)
        - increase heart rate (more O2)
        - Increase glucose release (more energy)
        - Increase adrenaline (epinephrine) and norepinephrine
        - Decrease in digestion (takes too much energy, want to divert energy to other areas)
    - Parasympathetic: "rest and digest" opposite effects of sympathetic nervous system
        - Pupils constrict
        - Increased Salvation
        - Decrease respiratory rate/decreased heart rate (back to normal)
        - Increase glucose storage (digesting food)
        - Decrease in adrenalin
        - Increase digestion.



Three Components of Emotion and the Universal Emotions

- Emotions are subjective experiences accompanied by physiological, behavioural, and cognitive changes. All interrelated. Every emotion produces different physiological changes in the body which can include changes in patterns of brain activation, neurotransmitter production, autonomic nervous system activity
- Ex: surprise party when it's your birthday. Different physiological responses possible.
- **Physiological** components – when surprised Heart rate might increase, muscles tense, temperature increase.
- **Cognitive** – vary person to person, they're mental assessments that can include appraisal of what is happening, thoughts and expectations about the situation. Cognitive experiences result from emotions, and can cause emotions. Ex. Someone might enjoy surprise party because of your previous cognition, or someone might hate surprise party.
- **Behavioural** – emotions produces different behavioral responses evident from body language or facial expression. Expressions vary by individual and interpreted differently culture to culture.
- Emotions are temporary (unlike moods which can last much longer, example of mood: anxiety). Emotions can be positive or negative. Can vary in intensity. Emotions can be involuntary (why we use phrases such as falls in love, explodes with range, overwhelmed w/ excitement)
- **Paul Ekman** found **6 main universal emotions** which can be identified by everyone around the world – happiness, sadness, fear, disgust, anger and surprise. Consistent facial expressions across culture and easily recognizable. (acronym: 6 universal emotions are: FAHDSS)

- **Happiness**: represented by, raised cheeks, elevated corners of mouth (sometimes: wrinkles on outer corner of the eyes, and teeth exposed)
- **Sadness**: represented by, uplifted inner corner of eyebrows, downturned lips
- **Surprise**: raised eyebrows, eyes open wise, jaws dropped/open mouth and teeth parted, horizontal wrinkles across forehead, upper lip raised, lower lid drawn down,
- **Fear**: eyebrows raised and drawn together, wrinkles in middle of forehead, eyes open intense, mouth open, lips drawn back slightly.
- **Disgust**: raised cheeks, wrinkled cheeks, eyebrows are lowered.
- **Anger**: penetrating stare, eyelids tense, lips pressed together.

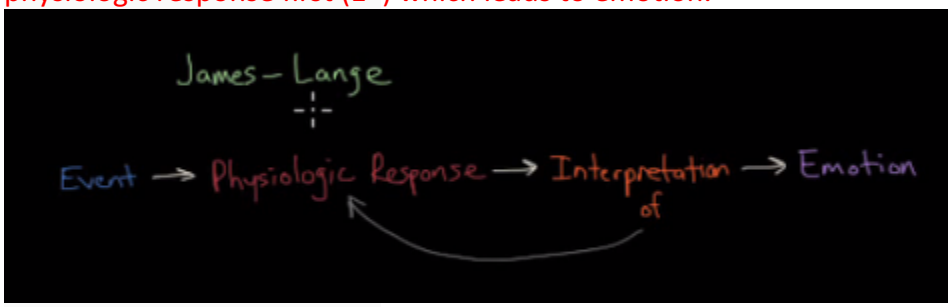
- Why are emotions universally recognizable? Darwin hypothesized ability to understand and express emotion is an innate ability that allowed them to act in ways that gave them a better chance of survival. Emotions have an adaptive value and emotions are innate.
  - Newborn baby react same way/have same emotions as grownups.
  - Blind individuals have same facial expressions as those who can see.

Theories of Emotion

- Emotion is made of 3 components: cognitive, physiological, and behavioural responses. Which response come first?
  - There are three core components of emotion – physiological arousal (how your body reacts to emotions, emotional information or stimuli), expressive displays (how you express your emotions), and subjective experiences (how you feel and

interpret your emotions, which is extremely personal and subjective). Conditioned responses are not a core component of emotion.

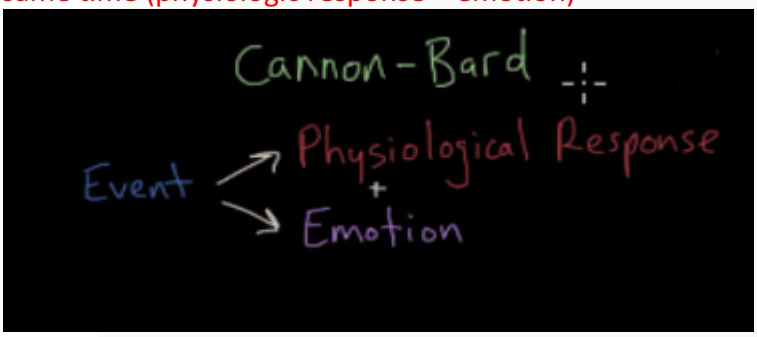
- 4 different series of emotion.
    - **James-Lange theory** – Experience of emotion is due to perception of physiological responses.
        - Ex. Holding pet cat (Event) → increased HR/neurotransmitters/smile (Physiological response) → Interpretation of Physiological response → happiness (emotion). It's not the cat making you happy…its something the cat is doing to your body makes you happy. When sad, don't cry because you're sad, you're sad because you cry.
        - Ex2: A man, who is allergic to bees, encounters a bee. The man's heart beat increases, he starts sweating, and he interprets these physiological changes as the emotion fear.
        - Ex. physiological arousal followed by aggressive emotions (not simultaneous). Awareness of physiological processes occurring that make you happy.
          Event → Physiological Response (PR) → Interpretation of PR → Emotion
          Acronym: J/L are one (1) apart on the alphabet, so they have a physiologic response first (1st) which leads to emotion.



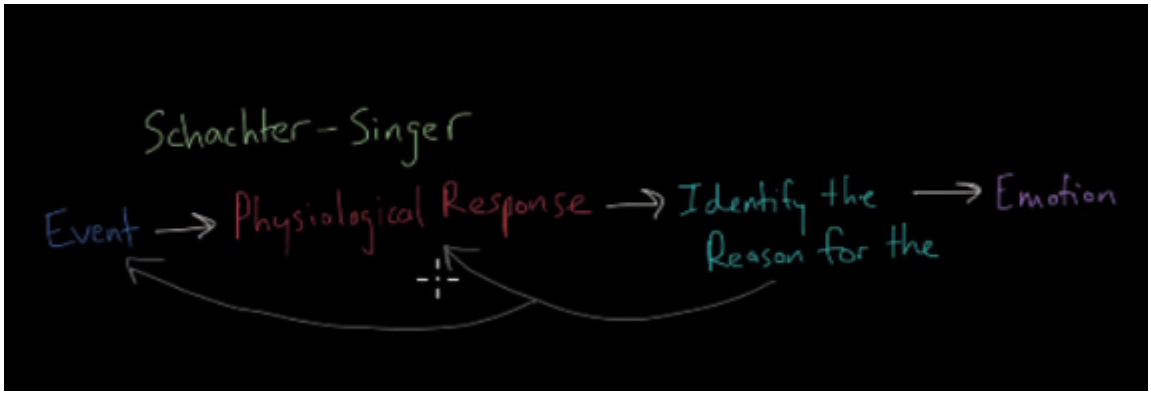
    - **Cannon-Bard theory** – disagreed with James-Lange, and found flaws in idea that physiological response triggered emotion.
        - Flaws they found:
            - They first said that you could experience physiological response w/o emotion ex. Your heart can race if you had a long run. If only physiological response was required to produce an emotion, shouldn't anyone with a racing heart feel afraid (an emotion where your heart races as well
            - Noticed many different emotions had same physiological responses. For example, heart racing shows feelings of anger and excitement. Two totally different emotions.
            - Physiological response system was too slow to produce emotion that seemed to happen almost instantly. Ex. Hearing a loud sound you would feel fear or surprise almost instantly and the

physiologic responses of your HR/muscle tone increase come later.

- They believed physiological response and emotion occurred simultaneously.
    - Ex: holding your cat (event) causes your heart rate (physiological response) to increase and feel joy (emotion) at the same time.
    - Ex2: A man, who is allergic to bees, encounters a bee. Simultaneously, the man's heart beat increases, he starts sweating, and he labels the emotion he is experiencing as fear.
- Simultaneously experience arousal and aggression
  Event → Physiological Response + Emotion at same time.
  Acronym: C/B are next to each other in alphabet so it all occurs at the same time (physiologic response + emotion)

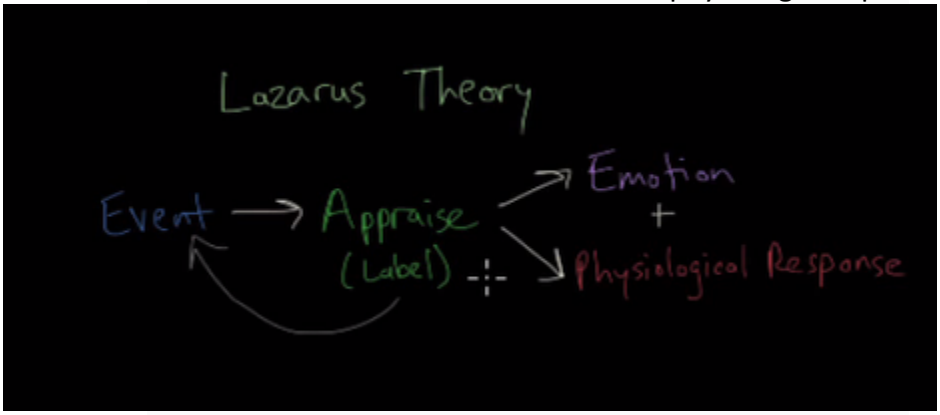


- **Schachter-Singer** (two-factor theory of emotion)– physiological and cognitive responses simultaneously form experience of emotion. If we become physiologically aroused, we don't feel a specific emotion until we're able to label/ identify reason for situation.
    - Ex: Holding your cat (event) → Physiological response of increase HR/or changes in NT level → label the situation and identify reason for physiological response and event (This is really nice, I like holding my cat, this makes me happy) → emotion (Happy)
    - EX2 A man, who is allergic to bees, encounters a bee. Simultaneously, the man interprets that his allergy to bees makes this encounter threatening, his heart beat increases, and he starts sweating. He labels the emotion he is experiencing as fear. Event → PR + Identify reason for the situation (PR) (consciously) → Emotion



- **Lazarus Theory** – experience of emotion depends on how the situation is cognitively appraised (labelled).
  - If we label emotion as good, it is positive
  - If we label emotion as bad, it is negative
  - How we label event is based on cultural/individual differences.
  - Event is the same and depending on label it produces two very different emotions
    - Ex: activity of jumping off a plane is terrifying for some but exhilarating for others depending on label.
    - Ex2: A man, who is allergic to bees, encounters a bee. Simultaneously, the man interprets that his allergy to bees makes this encounter threatening, his heart beat increases, and he starts sweating. He labels the emotion he is experiencing as fear.
  - Ex. Event (holding cat) --> labelling situation/appraising (cognitive) happiness→ emotion (joy) + physiological response.

Event → Label the event (appraisal) → emotion + PR based on appraisal.
+ if label is +
– if appraisal is – about the event.
Lazarus - "LAzarus" = "LAbel" leads to emotion and physiologic response



    - Recap:
        - James-Lange: physiological -> emotion
        - Cannon-Bard: physiological + emotion
        - Schachter-Singer: physiological + cognitive -> emotion
        - Lazarus: cognitive -> emotion + physiological
- Limbic system is involved in emotion: the **amygdala** is conductor of emotional experiences, communicating between the hypothalamus (physiological) and prefrontal cortex (behavioural). Amygdala plays key role in fear/aggression.
    - Emotions associated with memories are encoded in the **hippocampus.**
    - Prefrontal cortex involved in decision making, and reducing emotions. It also has **executive functions** – higher order processes such as planning/organizing/inhibiting/etc.
- People perform best when they are moderately aroused – the **Yerkes-Dodson Law,** a bell shaped curve.
    - The relationship between long term memory and fear follows a Yerkes-Dodson curve.
    - This means that extreme emotional responses usually impact memory negatively.
    - Moderate emotions, like mild fear, are associated with optimal memory recall.

Stress

What is Stress?

- Example: Dog is chasing a rabbit. The bunny could be expecting Stress.
- **Stress** is the process by which we appraise and cope with the environmental threads and challenges. It encompasses both the stressor and the stress reaction
- **Stressor**: Threatening/challenging event (ex. Dog is a stressor to the rabbit)
- **Stress reaction-** subsequent physical and emotional response (ex. bunny's response to the dog chasing it).
- **Richard Lazarus –** stress arises less from physical events but more from the assessment/interpretation of those stresses/events. Appraisal. This is the **Appraisal theory of stress**. There are two stages to the cognitive stages of stress – the primary appraisal and the secondary appraisal.
    - **Primary appraisal** – assessing stress in present situation. 3 categories of response to this primary appraisal – *irrelevant, benign/positive, or stressful/negative.* If primary appraisal is negative (stressful), move forward with secondary appraisal.
        - Irrelevant – I see the stress but it's not important.
        - Benign/Positive – Ex: a dinosaur takes out the dog – the rabbits enemy
        - Stressful/Negative – the stressor is actually threatening. Ex. Rabbit having to run away from the dog.

- **Secondary appraisal** – Evaluation of the individual's ability to cope with the situation. What is the individual's material preparedness to deal with stressor? Appraisal of *harm, threat, and challenge (how to overcome it).*
    - Harm: what damage has already been caused
    - Threat: How much damage could be caused
    - Challenge: How can the situation be overcome or conquered.
- Humans can have a stress reaction and also anticipate stressors! Makes the whole process a bit more interesting/complicated.

Stressors

- 4 major categories of stressors:
    - 1. **Significant life changes** – changes in your personal life. Ex. Death of loved one, marriage, loss of job, having children, leaving home, etc.
    - 2. **Catastrophic events** – A large scale event that everyone considers threatening. Ex. wars, natural disasters etc.
    - 3. **Daily hassles** – Seemingly minor events/hassles of daily life Ex. long store lines, forgetting car keys, aggravating roommates, email spam, car engine burns out, finding dog poop on your carpet, and tire punctured, expectations not communicated well b/w you and your spouse, inability to let go of an unobtainable goal etc.
        - Daily hassles often accompanies low SES- inadequate income or unemployment
        - For minorities daily hassles might include racism.
        - Many consider (like Mike Lazarus and Connor McDonald) the most important form of stress.
    - 4. **Ambient stressors** – Global stressors that are integrated into the environment. Perceivable, but hard to control. Can negatively impact us without us being aware of them. Stuff we just put up with in our lives. Ex. Pollution, noise, crowding

Responding to Stress

- Walter Cannon (1900s) spent lot of his career expanding our understanding of homeostasis (tendency for our body to respond to the environment and to keep it in homeostasis – temperature, pH) etc. He was interested in homeostatic response of animals to stressors - threats and dangers.
- Cannon was interested in the homeostatic response to stress. He termed our response to threats the "fight and flight response"
- Stressors like threats and dangers trigger our **fight or flight** system – the nervous system (**sympathetic nervous system)** (part of the ANS) and the **endocrine response.**
    - **Sympathetic Response**: Flight or flight:
        - This triggers our "get out of danger mode"
        - See increased heart rate and increased respiration (more energy + oxygen in blood + more CO_2 expelled), increased peripheral

vasoconstriction (push more blood to our core area/vital organs that it is hard to live without. We take blood out of the extremities like our legs/arms which are less essential for our survival), and turn off digestion/immune/ovulation (less crucial).

- **Endocrine response**:
  - Adrenal glands –
    - The adrenal medulla release catecholamine's (epinephrine/adrenaline and norepinephrine/noradrenaline). Catecholamine's are tyrosine derivatives. Developed from ectoderm.
    - The adrenal cortex release glucocorticoid (***cortisol)*** – steroid hormone redistributes glucose energy in body and suppressing immune system. Developed by endoderm. Acronym: COTisol is released by the CORTex
    - Play a role in development of muscles/bones.
- **Tend and befriend** response - sometimes better response to stress is to have support systems. ***Oxytocin*** is important for this – peer bonding and moderates the stress response. Oxytocin is strongly linked to estrogen (a major sex hormone in women), so why this response is stronger in women.

- Distinct stages of stress – **General Adaptation Syndrome (GAS)**, 3 phases by **Hans Selye:**
  - 1. **Alarm phase** – stress reaction kicks in, heart races, resources mobilized – "Ready for fight or flight"
  - 2. **Resistance** – fleeing, huddling, temperature elevated, BP high, breathing rate high, body bathed in cortisol.
  - 3. **Exhaustion** – if resistance isn't followed by recovery, our body's stress resources are depleted, our tissues become damaged and our dampened immunity can make us susceptible to illness. Negative impact of long term stress.
- We are equipped to short-term stress. But if we have them daily, but there will be serious negative consequences if they are maintained daily/long term.

Physical Effects of Stress

- Chronic Stress has serious negative effects to the body.
- Damaging effects of stress on our **heart**
  - Increased B.P, B.V distend, so they build up more muscle and become more rigid. Can lead to **hypertension (HBP)** and **vascular disease** (disease of blood vessels – get damaged with higher force of blood movement). Spots attract fat and narrow blood vessels. Worst place to experience this is coronary arteries – **coronary artery disease**.
- Damaging effects of stress on our **Metabolism**
  - During stress, body secretes cortisol and glucagon, which converts glycogen to glucose. Glucose increases in our blood which remains floating around in blood

vessels (we don't need all this extra glucose, which can exacerbate metabolic conditions like diabetes).
    - Too much blood sugar can also cause heart disease
- Damaging effects of stress on our **Reproductive**
    - Reproduction huge energy expense in women, so this gets shut down during stress response.
    - In women - FSH/LH and then estrogen/progesterone can be inhibited which reduce reproductive abilities
    - Boys have a reduced testosterone as well, but precise levels of testosterone not required so never really reduced to the point of infertility. Impotence /erectile dysfunction also often caused by stress because your blood vessels are being constricted (less blood flow to penis) and allows more blood to remain in core.
        - Impotence usually due to stress in the US!
- Damaging effects of stress on our **Immune Function** – divided into innate vs adaptive
    - Causes inflammation – acute stress can lead to overuse of immune system. Can attack our own body. Good example is arthritis (joint become overly inflamed)
    - Chronic stress: stop activating immune system response and it suppresses you. Doesn't make you sick, but makes you more susceptible to illness.
    - Studies:
        - 40% slower healing rate for puncture wounds delivered to grad students right before exam compared to same wounds inflicted during summer vacation
        - Increased susceptibility to virus to stressful individuals. 20% increase in development of cold
- Stress can have damaging effects!

Behavioural Effects of Stress

- 2 areas of brain with most glucocorticoid (secreted in response to stress) receptors are the **hippocampus** and **frontal cortex**
- **Hippocampus** - learning and memory. **Frontal cortex** responsible for impulse control, reasoning, judgment, planning. We do see atrophy in these areas subjected to stress.
- One of major emotional responses of stress is **depression** (problem is **anhedonia** – inability to experience pleasure, so perceive more stressors).
    - Biological backing: The **anterior cingulate** (anterior part of the frontal cortex) stops responding to serotonin. (acronym: anterior cingulate responds to serotonin - Anterior designers are CINGLEate (single) and love SEXetonin….when they get stressed they stop having SEXetonin (stop responding to serotonin)
    - **Learned helplessness** – you learn from having control ripped out of hands that you don't have control, so lose ability to identify coping mechanisms because taking less control of outcome of your life. Cycle continues downward into major depression.

- Other emotional/behavioral effect of stress: (acronym: Stress has Three S's, which corresponds to three As)
    - **A**nger is another response.
        - Meyer Friedman and Ray Rosenman were testing notion that stress is associated with increased vulnerability to heart disease, and when they interviewed the patients during their study and characterized them as either Type A or Type B.
        - Type A is easily angered individuals, aggressive, competitive
        - Type B is easy going
        - Those who had heart attacks later were mostly type A. The toxic component of Type A personality was being prone to hostility and anger.
        - Accompanies the "Fight" aspect of sympathetic response
    - **A**nxiety – centers on amygdala. Amygdala - fears and phobias, fits in perfectly with response to stress. Perceive more things as fearful.
        - Accompanies the flight aspect of sympathetic response
    - **A**ddiction – when searching for coping mechanisms there are good options and bad options. These terrible options lead to addiction often. ex. Alcohol, tobacco, etc.
        - Impairment to frontal cortex (reasoning), so impaired judgement can increase likelihood of inappropriate coping mechanisms.

Stress Management

- Coping with stress
    - **Perceived control** - many studies show lack of control associated with higher stress. Low SES increases stress.
        - Shown by Robert Sapolsky with Baboons who had social hierarchy structures similar to humans. Primates at the bottom of the barrel socially experienced much more stress than the ruling-elite baboons.
        - The White-Hall Study showed the exact same effect based on relative rank in the workplace in humans in Britain.
        - Suggestion: look for areas of life where you can take a little bit of your control. "King of your own castle"
    - **Optimism-** humor and optimisms linked to decreased stress. Nurture an optimistic outlook.
    - **Social support** – one of best coping mechanisms of stress. Allows us to confide thee painful/difficult feelings and allows us to understand we are not alone in stress, which helps in our perceived control and optimism.
        - Socially supported communities are identified as having better Eating/exercise/sleeping patterns. Marriage, domesticated animals, close friendships have been shown to decrease stress.

- Managing stress
    - **Exercise** – regular exercise requires control. Decrease risk of cardiovascular disease. Less Increase cerebrovascular health and increase neurogenesis (grow new neurons and processes). Need to exercise 20-30 minutes daily to get those cardiovascular affects you want.
    - **Meditation** – helps us lower our heart rate, Blood pressure, and cholesterol.
    - **Religious beliefs/faith** – correlated by generally healthier lifestyle, and social support.
    - **Cognitive Flexibility** – perspective change is huge in our perception of what is stressing us out. Good way is working with counsellor.
    - **Coping: coping** is expending conscious effort to solve personal and interpersonal problems, and seeking to master, minimize or tolerate stress or conflict. The effectiveness of the coping efforts depends on the type of stress and/or conflict, the particular individual, and the circumstances. Psychological coping mechanisms are commonly termed coping strategies or coping skills. Subconscious or non conscious strategies (e.g. defense mechanisms) are generally excluded. The term coping generally refers to adaptive or constructive coping strategies, i.e. the strategies reduce stress levels. However, some coping strategies can be considered maladaptive, i.e. stress levels increase. Maladaptive coping can thus be described, in effect, as non-coping. Furthermore, the term coping generally refers to reactive coping, i.e. the coping response follows the stressor. This contrasts with proactive coping, in which a coping response aims to head off a future stressor.
        - Coping responses are partly controlled by personality (habitual traits), but also partly by the social environment, particularly the nature of the stressful environment
- **Adaptive Coping Mechanisms / Positive Coping Technique /Constructive Coping –**
    - One positive coping strategy, anticipating a problem, is known as ***proactive coping*****. Anticipation** is when one reduces the stress of some difficult challenge by anticipating what it will be like and preparing for how one is going to cope with it.
    - Two others are ***social coping***, such as seeking **social support** from others, and ***meaning-focused coping***, in which the person concentrates on deriving meaning from the stressful experience.
    - Adequate nutrition, exercise, sleep contribute to stress management, as do physical fitness and relaxation techniques such as progressive muscle relaxation.
    - One of the most positive methods people use to cope with painful situations is humor. You feel things to the full but you master them by turning it all into pleasure and fun.
    - While dealing with stress it is important to deal with your physical, mental, and social well being. One should maintain one's health and learn to relax if one finds oneself under stress. Mentally it is important to think positive thoughts, value oneself, demonstrate good time management, plan and think ahead, and

express emotions. Socially one should communicate with people and seek new activities. By following these simple strategies, one will have an easier time responding to stresses in one's life.

- **Maladaptive Coping Mechanisms / Negative Coping Technique /Non-Coping Technique –**
    - While adaptive coping methods improve functioning, a maladaptive coping technique will just reduce symptoms while maintaining and strengthening the disorder. Maladaptive techniques are more effective in the short term rather than long term coping process.
    - Examples of maladaptive behavior strategies include dissociation, sensitization, safety behaviors, anxious avoidance, and escape (including self-medication).
        - These coping strategies interfere with the person's ability to unlearn, or break apart, the paired association between the situation and the associated anxiety symptoms. These are maladaptive strategies as they serve to maintain the disorder.
        - Dissociation is the ability of the mind to separate and compartmentalize thoughts, memories, and emotions. This is often associated with post traumatic stress syndrome.
        - Sensitization is when a person seeks to learn about, rehearse, and/or anticipate fearful events in a protective effort to prevent these events from occurring in the first place.
        - Safety behaviors are demonstrated when individuals with anxiety disorders come to rely on something, or someone, as a means of coping with their excessive anxiety.
        - Anxious avoidance is when a person avoids anxiety provoking situations by all means. This is the most common strategy.
        - Escape is closely related to avoidance. This technique is often demonstrated by people who experience panic attacks or have phobias. These people want to flee the situation at the first sign of anxiety.

Types of Maladaptive Coping Mechanisms:

- Overcompensation
    - Aggression, Hostility: Counterattacks through defying, abusing, blaming, attacking, or criticizing others
    - Dominance, Excessive Self-assertion: Controls others through direct means to accomplish goals
    - Recognition-seeking, Status-seeking: Overcompensates through impressing, high achievement, status, attention-seeking, etc.
    - Manipulation, Exploitation: Meets own needs through covert manipulation, seduction, dishonesty, or conning

    - Passive-aggressiveness, Rebellion: Appears overtly compliant while punishing others or rebelling covertly through procrastination, pouting, "backstabbing," lateness, complaining, rebellion, non-performance, etc.
    - Excessive Orderliness, Obsessionality: Maintains strict order, tight self-control, or high level of predictability through order & planning, excessive adherence to routine or ritual, or undue caution. Devotes inordinate time to finding the best way to accomplish tasks or avoid negative outcomes.
- Surrender
    - Compliance, Dependence: Relies on others, gives in, seeks affiliation, passive, dependent, submissive, clinging, avoids conflict, people-pleasing.
- Avoidance
    - Social withdrawal, Excessive autonomy: Copes through social isolation, disconnection, and withdrawal. May demonstrate an exaggerated focus on independence and self-reliance, rather than involvement with others. Sometimes retreats through private activities such as excessive tv watching, reading, recreational computing, or solitary work.
    - Compulsive Stimulation-seeking: Seeks excitement or distraction through compulsive shopping, sex, gambling, risk-taking, physical activity, novelty, etc.
    - Addictive Self-Soothing: Avoids through addictions involving the body, such as alcohol, drugs, overeating, excessive masturbation, etc.
    - Psychological Withdrawal: Copes through dissociation, numbness, denial, fantasy, or other internal forms of psychological escape
- Further examples of coping strategies include emotional or instrumental support, self-distraction, denial, substance use, self-blame, behavioral disengagement and the use of drugs or alcohol.
- Many people think that meditation "not only calms our emotions, but...makes us feel more 'together'", as too can "the kind of prayer in which you're trying to achieve an inner quietness and peace".
- **Low-effort syndrome** or **low-effort coping** refers to the coping responses of minority groups in an attempt to fit into the dominant culture. For example, minority students at school may learn to put in only minimal effort as they believe they are being discriminated against by the dominant culture.

Behavior

Biological Basis of Behavior

Structure of the Nervous System

- CNS and PNS
- CNS = brain and spinal cord.

    - Brain includes cerebrum, cerebral hemispheres, brainstem (midbrain, pons, and medulla), and cerebellum.
    - Forebrain, midbrain, hindbrain. Forebrain becomes cerebrum, midbrain becomes midbrain, and hindbrain becomes pons/medulla/cerebellum
- PNS = everything else. Cranial (12 pairs) + spinal nerves (31 pairs)
    - Nerves, ganglia. Afferent and efferent neurons.

Functions of the Nervous System

- Basic and higher functions.
- Basic = motor (control of skeletal muscle), sensory (the senses), automatic (reflexes)
- Higher = cognition (thinking), emotions (feelings), and consciousness

Motor Unit

- **Lower motor neurons (LMN)** – efferent neurons of the PNS synapse on control skeletal muscle. Skeletal muscle cells it contacts is the other end of the motor unit. Form a **neuromuscular junction**.
- Abnormalities can occur in the motor unit – weakness.
- Abnormalities of LMN can cause the **lower motor neuron signs** (LMN signs), which can happen in addition to weakness.
    - Signs: **atrophy** of skeletal muscle, **fasciculations** (involuntary twitches of skeletal muscle), **hypotonia** (decrease in tone of skeletal muscle – how much muscle is contracted when person is relaxed), **hyporeflexia** (decreased muscle stretch reflex)

Peripheral Somatosensation

- Somatosensation includes 5 main ones - position sense, vibration, touch, pain, temperature.
    - Position + vibration + touch = **mechanoreceptors**, pain = **nociceptors**, temperature = **thermoreceptors**.
        - Nocireceptors and thermoreceptors = slow
        - Position/Vibration/Touch (Mechanoreceptors) = Fast

Type of Receptor	Stimuli	Location
Mechanoreceptor	Mechanical stress Pressure changes (*baroreceptors*) Sound waves Gravity	Skin Blood vessels Ear
Chemoreceptor	Specific chemicals Total solute concentrations (*osmoreceptors*) Blood pH (CO_2 levels) Prostaglandins (*nocireceptors*)	Tongue Blood (dissolved chemicals) Nose (vaporized chemicals) Tissue
Thermoreceptor	Heat Cold Certain food chemicals (e.g. capsaicin)	Skin (external stimuli) Hypothalamus (internal stimuli)
Photoreceptor	Light (visible wavelengths)	Eyes (rod and cone cells)

	Type of Mechanoreceptor	Location in Skin	Hairy/Non Hairy Skin	Requires? (to fire)	Sensation	Adaptation
:ronym: CM RP	MCM RP (man crush Monday role play)	Acronym: Superficial → Deep MCM = Papillary dermis **R =** Reticular dermis P = subcutaneous layer	Acronym: MC (Man Crush"= Meiseinheimers Corpuscle = "man crushed of hair"	Periphery letters (MC and P = Changing touch required Middle letters = MR = sustained touch required	You feel touch, pressure, stretch, and then a vibration.	
C :	Meissinheiners Corpuscle	Papillary Dermis	Non hairy skin	Constantly changing stimuli FAI	Light Touch, flutter, light stretch, small receptive field, grip control	velocity
=	Merkel Disk/Receptor	Papillary Dermis (sometimes stratum Basale)		Sustained stimuli/constant SAI	Light Touch, pressure, fine details, small receptive field	Velocity and displacement
=	Ruffini Endings/Corpuscle/Cylinder	**R**eticular dermis		Sustained stimuli/constant SAII	Deep stretch (acronym: R = Role = playing a role requires stretching your imagination). , large receptive field	Displacement
=	Pacinian Corpuscle (also called Lamellar Corpuscle)	Hypodermis		Constantly changing stimuli FA II	Vibration – deep "**P**ush/**P**oke" (acronym: Phone vibrates)	acceleration
	Hair Follicle Receptor	Reticular dermis *Equivalent to Meiseinhhimers corpuscle in a sense for hairy skin)	Hairy skin	Constantly changing	Hair movement/light touch	Displacement

    - One of differences between two types is how big their axons are – position/vibration/touch receptors have large diameter axons. Have thick myelin sheath. Fast.
    - Rest have small diameter axons. Slower.
    - Touch is both. Fine touch travels in fast neurons, less precise info travels in slower ones.
- Many receptors found in the skin. Ex. Mechanoreceptors, one type close to skin, another type lower. Also some in deep tissue, deep in muscle that detect stretch. One in muscle important for position, while ones in skin are imp for vibration/touch.
    - Pain and temperature receptors end in uncovered terminals, don't have big structures like mechanoreceptors.
    - Mechanoreceptors tend to have large diameter and thick myelin sheath; therefore, they conduct fast. Noci- and thermo- have small and have thin myelin or no myelin->slow.
- Receptors send info through **afferent** axons

Muscle Stretch Reflex

- Reflexes have 2 parts – **afferent** (stimulus) and **efferent** (response).
- The **muscle stretch reflex** (happens on same side [afferent & efferent] - causes a muscle to contact after it's stretched, as a protective response. Ex. Knee jerk response – involuntary response of leg kicking out. The hammer hits the tendon right below the knee cap, which hooks onto the lower leg bone on one end, and a large group of upper muscles on the other. Muscles are called **muscle spindles**.
    - **Somatosensory neurons** (afferent) in muscle spindles form excitatory synapse in spinal cord with another neuron in the spinal cord, which sends axon out back to same muscle that was stretched, and excite skeletal muscle cells to contract – **lower motor neurons** (efferent).
    - Muscle on underside of leg are inhibited when the topside of leg is excited. Necessary for reflex to occur.

ANS (No Conscious Involvement)

- Efferent Neurons in PNS
    - Ctrl smooth muscle cells, cardiac muscle, and gland cells
- Divides into sympathetic (SNS) and parasympathetic (PNS) nervous systems
    - SNS starts middle of sp. Cord → short axon synapses with short ganglia close to spine → second neuron goes to the target cell (smooth, cardiac, gland cells)
    - PNS → starts at the brain stem or bottom of spinal cord → 1st neuron sends long axon → synapse with ganglion of second neuron → sends short axon to target cell
        - General – both have 2 chains of axons. SNS is short and then long. PNS is long and then short.

- SNS – "Fight or Flight" – blood flow to intestine decreases → goes to skeletal muscle; HR increases; sweat glands activated
- PNS – Rest or Digest – blood flow to intestine increases; HR decreases; salivary glands activated

Gray and White Matter

- **Gray matter** contains most of the neuron somas.
- White matter contains **myelinated axons**.
- In spinal cord, grey is on inside and white matter on outside.
- For brain →differ: White on inside and grey on outside. Axons go down tracts of white matter.

Upper Motor Neurons

- LMNs control muscles of limbs and trunk, while LMNs that pass through cranial nerves control muscles of head and neck.
- UMNs control the LMNs. Found in the cerebral cortex, and synapse on LMNs in the brainstem or spinal cord.
- Can divide them into tracts depending if they go to brainstem, or spinal cord.
    - UMN starts in cerebral cortex, axon travels down through brainstem, and where it meets the spinal cord most of these axons cross and travel down other side until they reach LMN. This collection of axons is called the **corticospinal tract**.
    - If it goes to brainstem, called **corticobulbar tract**
- **Upper motor signs:**
    - **Hyperreflexia** – increase in the muscle stretch reflexes. Cause is unclear, but when muscle spindle receptors are activated, without periodic stimulation of LMNs by UMNs, they become hypersensitive and you get bigger reflex.
    - **Clonus** – rhythmic contractions of antagonist muscle. Ex. Foot goes involuntarily up and down. Cause is hyperreflexia, because if doctor pulls on foot activates muscle stretch reflex, so triggers antagonist muscles.
    - **Hypertonia** – increased tone of skeletal muscles. Increase muscle tension, reduce muscle stretch.
    - **Extensor Plantar Response** – if you take a hard object and scrape along bottom of foot, normal response is flexor – toes will come down on the object. But with extensor, toes extend up.

Somatosensory Tracts

- Somatosensory information travels in different pathways. In general: 2 big categories: 1) position sense, vibration sense, and fine touch and 2) pain, temperature, gross(less precise) touch
- Deliver info to spinal cord.

- Spinal cord carries info to the brain in one of the tracts. Crosses other side immediately, then goes to cerebrum.
- Why injury to one side of brain often results in damage to other side → because all the somatosensory pathways cross to the other side.

Overview of the Functions of the Cerebral Cortex.

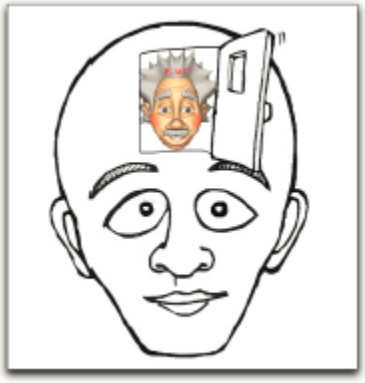
- Cerebral cortex bumps = increase cellular mass/surface area.

The Brain and its Hemispheres

Cortex: imagine a Texas hat on your head which is covering the outermost part of your brain – the cor"tex".

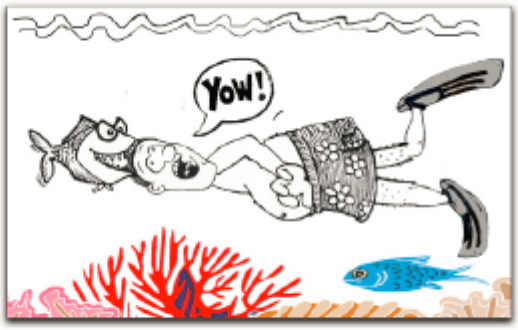
- Acronym: F-POT
- **Frontal lobe** – motor cortex (body movements), prefrontal cortex (executive function, surprise/direct other areas of brain), Broca's area (speech production)

Frontal Lobe: the frontal lobe is where complex thinking occurs. Use "front door" as your mnemonic. Put the front door on your forehead and put Einstein (complex thinker) behind the door.



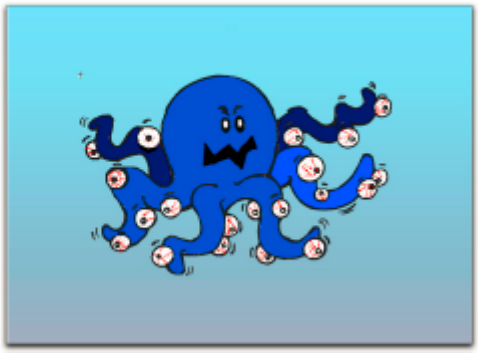
- **Parietal lobe** – somatosensory cortex (touch/pressure/pain), spatial manipulation (orient in 3D)
    - **SOMATOSENSORY CORTEX**: motor cortex (frontal) + Somatosensory cortex (parietal). Somatosensory cortex - Involved in receiving sensory signals from the skin

Parietal Lobe: processes sensory information. Use a "piranha" fish as your mnemonic. The piranha bites you on the top of the head (where the parietal lobe is located). That's a sensation the parietal lobe would process.



- **Occipital lobe** – vision, "striate cortex" (striated cells)

Occipital Lobe: Use the "Occ" part of the word Occipital and imagine an octopus. Since the occipital lobe processes visual information, picture eyeballs instead of suckers on the tentacles. Always good to make your image scary if you can.



- **Temporal cortex** – sound, Wernicke's area

Temporal Lobe: the temporal lobe is where auditory processing occurs. Use "tempo" as your mnemonic and picture a metronome above your ear (where the temporal lobe is located)

Hemisphere Differences and Hemisphere Dominance

- **Contralateral control:** left brain controls right body and right brain controls left body. Basically true for all of your senses. [This doesn't apply to smell: which is ipsilateral (same side)
- **Dominant Hemispheres:**
    - **Left hemisphere is dominant for vast majority of people.**

- Domain hemisphere: language, math,
- Non-dominant: emotional tone of language, if people are happy/sad/anxious, creativity, music, special processing, big picture concepts.
- We use both dominant and non-dominant hemispheres!
- Hemispheres communicate via corpus collosum.
- Left-handed people have differences in the lateralization of some aspects of audition and language understanding compared to right-handed people. These differences are not completely understood.

The Old Brain

- Brain needs to take care of survival at the minimum.
- Brains more complex as animals are more evolved.
- Brain structures are building on itself (on top of old ones). Inside of brain = older structures/most simple…where we control breathing/sleeping
- Superficial = higher order
- Old Brain (all occur outside of our awareness):
  - brainstem. (mostly covered by brain) and is the medulla and pons. Controls heart beat/breathing and cross over point for our nerves.
  - Reticular formation: from brainstem to other brain areas. It filters info and sends important info to the thalamus. Sleep/wake cycle (arousal). Ability to be aware.
  - Thalamus (above brainstem) relay station (eye/ear info) goes to thalamus.
  - Cerebellum – coordinates voluntary movement. [Alcohol effects this area]

Cerebellum

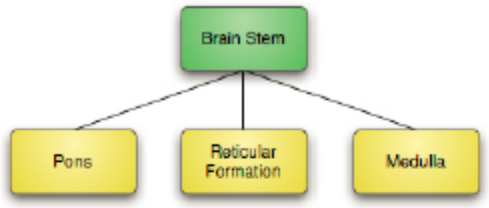
- Coordinates movement: **motor plan** info is sent to cerebellum, also receives **position sense** information (ex. Muscle stretch fibres), and sends feedback to the cerebellum and motor areas of motor cortex.
- Middle of cerebellum coordinates middle body movement and walking, while the sides are involved in movements of the limbs – arms and legs. Also speech and movement of eyes.

Cerebellum: involved in helping you maintain balance. Picture a tight walker using bells for balance. Or picture your favorite athlete trying to balance a bell on his/her head.

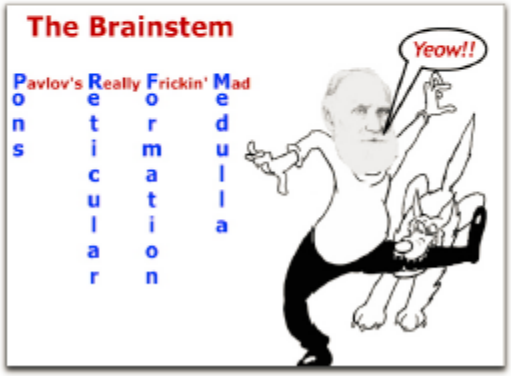
Brainstem

- Connects all parts of the brain together, including the cranial nerves.

- Midbrain, pons, medulla (also called medulla oblongata)
- Neuron somas scattered throughout brainstem is the **reticular formation** – big role in autonomic functions, and controlling things like respiration, digestion, and lower/higher functions.
- **Long tracts** – collections of axons connecting cerebrum and brainstem. 2 long tracts that are important: **motor** (UMNs), and **somatosensory**.
- **Cranial nerves** – most of cranial nerves are attached to the brainstem, doing many things. 12 pairs. All sorts of functions.



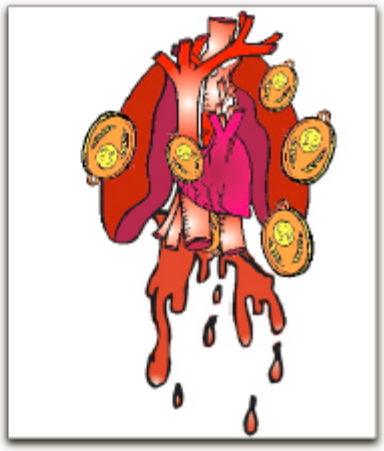
Acronym: Pavlov's Really Frickin' Mad!



Pons: the pons is the part of the brain that regulates waking and relaxing. Put a "d" in pons and you have "ponds". Ponds are relaxing to look. Your pons is activated when you look at a calm, relaxing pond.

Reticular Formation: the reticular formation is involved in motivation and alertness. Use "tickle" as your mnemonic. If you (or your roommate) were asleep and someone tickled you, your reticular formation would wake you up.

Medulla: the medulla regulates the autonomic activity of the heart and lungs. Use medals as your mnemonic and stick the medals in a bloody heart and lungs. Or picture an Olympic athlete wearing gold medals around her neck and covering her heart and lungs.

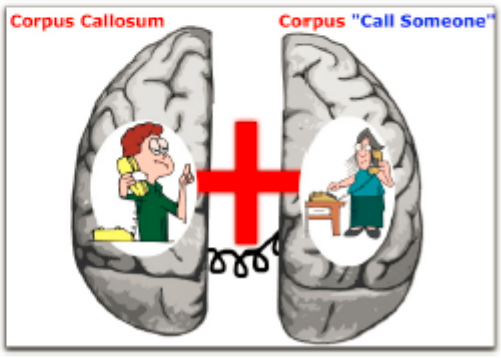


Subcortical Cerebrum

- Subcortical cerebral nuclei that are located deep part of the cerebrum
- **Internal capsule –** contains many important pathways, including the corticospinal tract
- **Corpus collosum –** connects right and left cerebral hemispheres.

Corpus Callosum: the corpus callosum connects the two hemispheres. Thus, the corPLUS CalloSUM.

Corpus Callosum: it is through the corpus callosum that the two hemispheres communicate. Thus, you could also picture "corpus CALL SOMEONE".



- **Basal ganglia** – major role in motor functions, don't have UMNs but help motor areas to perform proper movements. Also cognition + emotion.
- **Thalamus** – Sensory functions, because all senses have pathways that travel to the thalamus. Also higher functions of brain such as cognition and emotion.
- **Hypothalamus** – controls the pituitary gland, the master gland that controls all other glands in body.

Neurotransmitter Anatomy

- Cognition, consciousness important.
- **Glutamate** – most common excitatory neurotransmitter. **Reticular activating system** (required for **consciousness –** midbrain structures) has diffuse projection of glutamate to the cerebral cortex. [GLU is exciting]
    - Glutamate is associated with increased cortical arousal.
- **GABA** (brain) and **Glycine** (spinal cord) – most common inhibitory NTs]TWO other G's are inhibitory]
- **Acetylcholine** – nuclei (Basilis and septal nuclei) in frontal lobe [***frontal lobe= start so A]*** that releases it to cerebral cortex, Released for LMNs, and the autonomic nervous system.
- **Histamine** – from **H**ypothalamus sends to cerebral cortex.
- **NorePinephrine** – area in **P**ons called the **locus coeruleus** that releases it to cerebral cortex. Also ANS, but less so than Ach.
- **Serotonin** – Released by lots of nuclei from all over the brainstem (midbrain, pons, and medulla) called raphe nuclei to cerebral cortex release serotonin. Raphe nuclei also

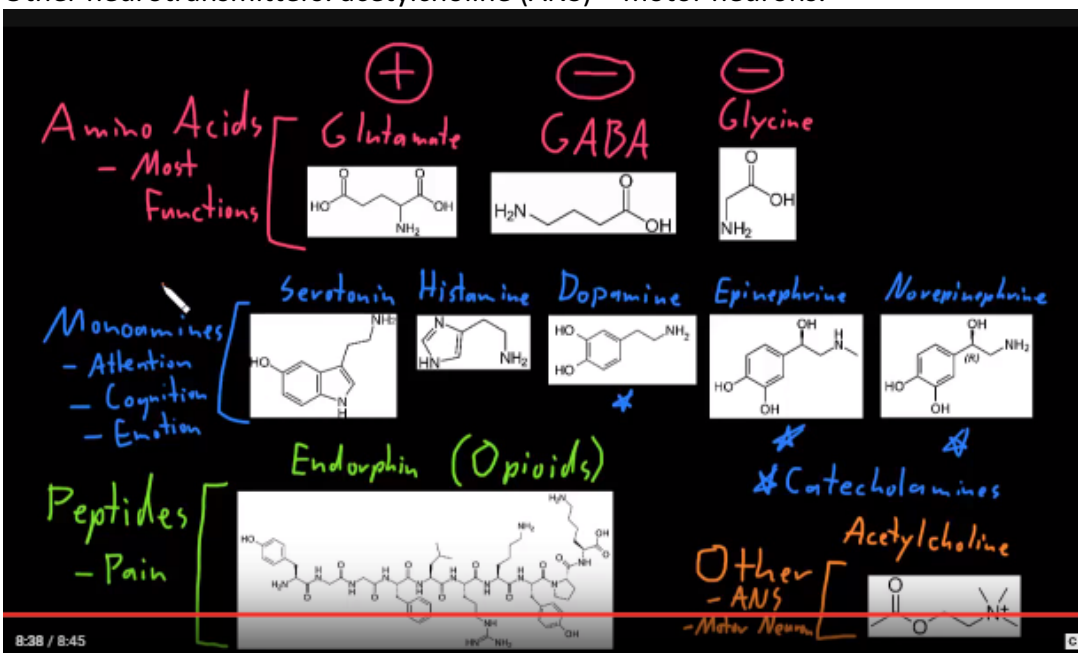
send serotonin to other parts of the nervous system. [Like **S**ex= messy. From everywhere down low (brain stem)]

- **Dopamine** – VTA and substantia nigra
    - Next to VTA in the brainstem (overlapping) sends axons release dopamine to a few nuclei deep in the cerebral hemisphere (all parts of the basal ganglia). These brainstem (midbrain neuron collection that is projecting dopamine is called the substantia nigra). It is actually projecting dopamine to another part of the basal ganglia called the striatum. If this can't happen – this is what's called Parkinson's disease.
        - Dopaminergic neurons also in the hypothalamus that send dopamine to Pituitary gland to control release of one of the hormones in the pituitary gland. This is all in the CNS in the brain and the spinal cord.
    - Dopamine, produced in the arcuate nucleus, is transmitted from the hypothalamus to the pituitary gland via the tuberoinfundibular pathway. The dopamine released regulates the secretion prolactin by inhibiting its release in the anterior pituitary. (acronym: ARkan ATE (nucleus) and a TUBE IN FUN MILK (tuberoinfundibular) (prolactin).
    - Dopamine, produced in the substantia nigra, is transmitted from neuron soma to axons projecting into the caudate nucleus and the putamen of the neostriatum via the nigrostriatal pathway. This pathway is associated with motor planning and purposeful movement.
        - Substantia nigra → motor planning (acronym: striatum pathways, and PUTaNUM and CAUsUal DATE PLANNING)
    - Dopamine, produced in the ventral tegmental area (VTA), is transmitted from the VTA to the pre-frontal cortex via the mesocortical pathway. This pathway is associated with cognition, affect, and negative symptoms of schizophrenia.
        - VTA → CORT = negative symptoms
    - Dopamine, produced in the ventral tegmental area (VTA), is transmitted from the VTA to the nucleus accumbens, the amygdala, and the hippocampus. The mesolimbic pathway is associated with reward, motivation, and many of the positive symptoms of schizophrenia
        - VTA→ LIMBIC (nucleus accumbens, amygdala, hippocampus) → reward/positive symptoms
- In the peripheral nervous system: the two main Neurotransmitters are acetylcholine and epinephrine. Acetylcholine is the main (and is involved in CNS and also the ANS- -- most neurons release acetylcholine and they release…).
- Neurotransmitters bind to external-ligand gated ion channels (one type of ion channel).

Types of Neurotransmitters:

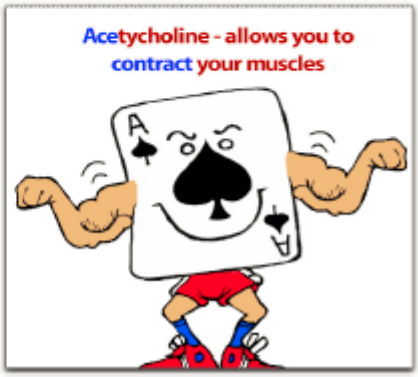
- Amino acid neurotransmitters: GABA (CNS) + Glycine (PNS)
- Peptide neurotransmitters: opiods (endorphin). Perception of pain

- Monoamine neurotransmitters (biogenetic amines): amino group and aromatic group connected by 2-carbon chain. Cognition/thinking/emotion/attention. Drugs
    - Subgroup: catecholamine's (benzene w/ 2 hydroxyl groups)
- Other neurotransmitters: acetylcholine (ANS) + motor neurons.

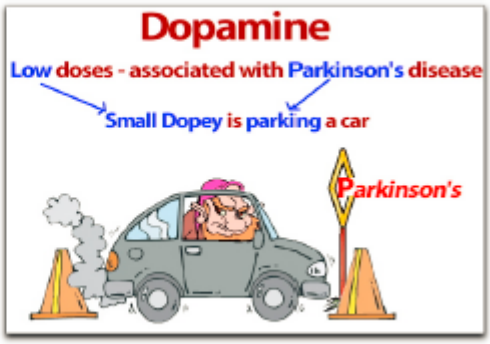


Serotonin: low levels of serotonin in the brain are associated with depression. In this case we have "Sir Rotten" who is in a rotten mood (depressed)

Acetylcholine: involved in helping you contract your muscles. Use an ACE flexing his muscles as your mnemonic.



Dopamine: **low levels** are associated with **Parkinson's** disease. Use the dwarf "dopey" as your mnemonic.



Dopamine: **high levels** are associated with **schizophrenia.** Use a tall dwarf as your mnemonic

Endorphins: involved in blocking pain sensations and in producing "runner's high". That's why the running door with fins looks happy.

Early Methods of Studying the Brain

- Some scientists believed that the soul generated our actions
- Phrenologists – each brain area is devoted to a certain personality characteristic, thought, emotion. [They were wrong, but there are brain areas associated with specific tasks]
    - As areas of the brain developed – they would grow and create bumps on the skull which could then be used to study individual
    - Early ways to study brain were limited. Wait till someone died and then study it. It told them about the structures of the brain but it did not tell them how the

brain functions, how the brain generates thoughts, how the brain controls the body.
    - So to figure out how it worked – they waited till someone got a brain injury and then the effect the brain injury had on an individual. [We don't have control of when this happens, so not the best way to study! Also an accident typically causes problems with many areas – makes it hard to isolate what brain area is responsible for which behavioral change]
    - Cerebral localization: specific parts of the brain can control specific aspects of behavior and emotion, thought, personality.
- Broca studied a patient with the loss of speech (but no other mental disorder). This patient (along with others who he studied) had a specific part of the frontal lobe that was damaged (Broca conducted autopsies to figure this out). This brain region was involved in speech production. This area is called the **Broca's area. Broca's aphasia**: loss of ability to express speech.
    - In this method you have to wait till someone dies to figure out what brain area is damaged.
        - In this time, a patient can have more brain injuries that occur.
        - Patient can outlive scientist
        - Patient could move away. Family could refuse autopsy/access to brain and body

Lesion Studies and Experimental Ablation

- Deliberately making brain lesions /destroying tissues in order to observe changes on animal's behavior. Not done with humans! Brain function studied by destroying parts of brain and then studying resulting changes in behavior. Functions that no longer can be performed are the ones that were performed with that brain area.
- Lesion studies can be performed in the following ways
    - Tissue removal: surgical removal, surgical aspiration (sucking out brain tissue), or severing the nerve with a scalpel (this allows for a destroying of the brain tissue in place…less invasive)
    - Radiofrequency lesions – used to destroy tissue on surface of brain and deep inside brain. Wire is inserted into brain to determine the area. Then pass high frequency current which heats up and destroys tissue. Can vary current intensity/duration to change size, but destroys everything in the area (cell bodies and axons). You can't tell if this area was responsible for the behavior that is not responding, or just has an axon passing through.
    - Neurochemical lesions – MUCH MORE PERCISE METHOD. Excitotoxic lesions (excitotoxins are chemicals that bind to glutamate receptors and cause influx of calcium that causes so much excitement that kills the neuron/ excites it to death.

        - One example is **kainic acid**. Destroys cell bodies but doesn't influence axons passing by. Don't severe connections like in knife cuts/radiofrequency lesions.
        - Also **oxidopamine** (6-hydroxydopamine) selectively destroys dopamine and NE neurons. Can model Parkinson's Disease.
            - Oxidopamine is very similar to dopamine. In reuptake, the presynaptic cell takes the oxiopamine back for recycling (normal mechanism) but then this neuron is destroyed. It destroys substantia niagra neurons completely.
    - Cortical cooling (Cryogenic blockade)- involves cooling down neurons until they stop firing.
        - Cryoloop – surgically implanted between skull and brain. Most important part is it's temporary/reversible, unlike other techniques. K/O nerves – see effect, and then bring the animal back to normal functioning.
    - Temporary lesions can be created via neurochemical means. Muscimol can bind to GABA receptors and inhibit those neurons.

Modern Ways of Studying the Brain

- Two main types: Brain structure and brain function
    - Brain structure (acronym: CATs (the company) and Magnets (MRI) used to make buildings (a structure). Take x-ray of a CAT (the animal) to know CAT uses x-rays). Great for determining size of brain.
        - **CAT** (**Computerized Axial Tomography**) scans (CT scan). X-rays to create image of the brain (tumor/abnormal swelling/bleeding…but it can't tell us anything about what areas of the brain are active in a given time.)
            - CT scans are a computerized composite of X-ray images that are slightly lower resolution than MRI and are not as good for soft tissue but are faster than MRIs. Sometimes CT scans are combined with a radioactive dye (like a PET scan) to show structure and activity imposed in one image.
        - **MRI (Magnetic Resonance Imaging)**- This method uses radio waves and they are exposed to a magnetic field. The radio waves are then added to the magnetic field and disrupts orientation of atoms. As atoms move back to alignment with magnetic field they release signals and those are used to create image. This also doesn't tell us anything about brain function either.
    - Brain function (acronym: Electro (EEG) – think electricity can tell you about function, MEG rhymes with EEG)
        - **EEG (Electroencephalogram)** – external, can't tell us about activity of individual/groups of neurons. Can only look at sum total. Can tell us about seizures, sleep stage, cognitive tasks. Not invasive! We don't get a

picture of a brain from this method, but we get an EEG. Easier set up than MEG.
        - **MEG** (**Megnetoencephalogram**) (aka **SQUIDS** - **Superconducting quantum interference device)**– better resolution than EEG, but rarer because requires a large machine and special room to shield it. Records the magnetic fields produced by electric currents in the brain. Measured by using SQUIDS. (acronym: MEGa SQUIDS are invasive)
- Can we combine brain structure and function? Yes!
    - **fMRI** (**functional Magnetic Resonance Imaging**)– same image from MRI but can look at which structures are active! Neurons that are active require oxygen. Measuring relative amounts of oxygenated vs deoxygenated blood in the brain – we can figure out what brain areas are being used for a certain task. fMRI is more popular. (acronym: f =functional = tells us function about specific region of brain)
        - MRI registers magnetic changes via radio waves and fMRI is a calculated composite of several MRI images registering the changes (shows activity as colored areas over MRI). MRIs are slow but offer high resolution of soft tissue, such as the brain.
    - **PET (Positron Emission Tomography**) scans – can't give us detail of structure, but can combine them with CAT scans and MRIs. Inject glucose into cells and see what areas of brain are more active at given point in time. (Active cells = use most glucose). More invasive. (acronym: PETs like glucose). Three-dimensional images of tracer concentration within the body are then constructed by computer analysis
        - PET require swallowing a radioactive tracer and shows activity, with low resolution.

Endocrine System and Influence on Behaviour – Parts 1 & 2

- Hypothalamus – regulates how much fluid in blood volume in any given time.
- Endocrine system produces glands that produce hormones that produce effect. Endocrine system (slow) and nervous system (fast but not very long-lasting effects) are related.
- Hormones can be:
    - Protein/polypeptide: Small→ large (100)
    - Steroid: from cholesterol (lipid – not charged and can pass freely thru mem)
    - Tyrosine derivative: from tyrosine. Thyroid hormones and catecholamine's (adrenal medulla produces this)
- Three types of hormone effects:
    - Autocrine – effects the cell that makes it
    - Paracrine – regional effect
    - Endocrine signals – response that is far away.
- Parts:

- **Hypothalamus**: nervous system and endocrine system connection (very small)
- **Pituitary**: master gland
  - Anterior: (FLAT-PEG) FH, LH, ACTH, TSH, Prolactin, Endorphins, GH
    - GH - The pituitary gland triggers the growth spurt that occurs during adolescence.
  - Posterior: ADH + Oxytocin
  - (Intermediate Lobe) Pars Intermedia – MSH (Melanocyte stimulating hormone)
- **Thyroid:** regulate body metabolism. T3/T4
  - The thyroid gland affects the growth and development of the brain, and regulates growth rates.
- **Parathyroid:** 4 spots back of thyroid. Regulate calcium level.
- **Adrenal glands**: on top of kidney (adjacent to kidney): ACTH acts on adrenal cortex (steroids (fluid volume; stress resp.)- glucocorticosteroids like cortisol) and medulla (catecholamine's hormones)
  - The adrenal gland plays a supportive role in development of muscle and bones.
- **Gonads**: ovaries (females) testes (male). FSH/LH stimulation releases sex hormones (progesterone's/estrogen (females) and testosterone (male)
  - The testes are involved with male sexual development during adolescence.
- **Pancreas**: regulates blood sugar. Not tied to pituitary gland.

- Concentration: very low concentration (pictograms/mL). Hormones go everywhere but are only picked up by cells that have receptors.
- Hormone concentration is regulated by:
  - Metabolism (metabolized by liver and makes bile) and kidney (excretes them into urine after breakdown).
  - Secretion: controlled by negative feedback loops.
    - Ex: Hypothalamus –(TRH) → Anterior pituitary –(TSH)-→ Thyroid ---(T3 (thyroxin)).
      - T3 negative feedback to TSH/TRH
- Endocrine system relation to behaviour:
  - Behaviour coordinated response to environment
  - Hormones effect how we respond to attitude/personality.
  - Cognitive behavioral therapy: Control what your body is doing physiologically with your mind. When you are afraid for example, epinephrine causes increase heart rate etc. (fight or flight response). When you are no longer scared, become calmer and hormones then get reduced.

Human Development

Egg, Sperm, Fertilization:

- Sperm: sex cell of male. Transfer male genetic material to egg. Sperm has a head, tail (flagellum/propeller), and a middle section (which has lots of mitochondria – 75/100 – larger mitochondria). Propelling = takes lots of energy that comes from mitochondria. Head – contains DNA material and the acrosome.
- Egg Cell: Really big! Not made for mobility. Cell = 10Kx more massive. Egg has genetic material and a thick outer coating (zona pellucida that is a thick layer of glycoproteins – protein w/ branching sugar chains). Deep to zona pellucida - plasma membrane. Once sperm gets through plasma membrane = fertilization! Egg cell has mitochondria (200K mitochondria) but also other organelle.
- Fertilization: When sperm and egg meet. Steps of fertilization are: sperm binding→ acrosome reaction → cortical reaction → genetic transfer
    - Sperm Binding: When sperm comes in contact with zona pellucida. Sperm binds to zona pellucida.
    - Acrosome reaction: enzymes leak into zona pellucida and digest it. Sperm gets closer to plasma membrane of egg.
    - Cortical reaction: in egg there are enzymes (contained w/n cortical granules) that get ejected to zona pellucida and that digest the zona pellucida. Prevents other sperm from binding. (Block to polyspermy). If this doesn't happen, zygote fails.
    - When sperm binds to plasma membrane and acrosome is gone, cortical granules are released, the plasma membranes fuse and all the genetic material gets released into egg. Fusion of genetic material is fertilization.
        - Nuclear DNA comes in but also mitochondrial DNA (but the egg has WAYY more mitochondrial DNA that the sperm cell doesn't have much effect).
- Embryogenesis:
    - Zygote after fertilization has occurred then splitting occurs in zona pellucida (which still exists, in the previous stem the zona pellucida hardens to prevent sperm binding – now its back)
    - Cleavage happens (splitting w/o growth): Splitting from 1cell→ 2 cell→ 4cell → 8cell → 16 cells →
    - Morula: 32 cells. The cells become tighter (cells get closer together and the outside cells become different). Differentiation is occurring. The outside is trophoblast and the inside is an embryoblast.
    - Blastulation occurs:
        - Blastocyst: Now the inside = cluster more and you develop an inner cell mass and blastocoel (hollow space). Zona pellucida disintegrates.

        - The inner cell mass then make an amniotic cavity and the bottom cells of the inner cell mass differentiate into hypoblasts. The cells above the hypoblasts are called epiplasts.
        - Bilamar disk (epiblast + hypoplast)
        - Primitive stream forms. Where the epiblast cells start to migrate.
    - Gastrulation: trilaminar disk (germ layers formed). Ectoderm, mesoderm, endoderm
    - Neurulation: Core in the mesoderm differentiates into a notochord. Notochord induces change above on cells above in the ectoderm (cells become thicker) called the neural plate.
        - Neural plate cells begin to dive into mesoderm. Ring structure/tube forms and becomes known as a neural tube. You have neural crest cells too on the side.

Implantation

- Blastocyst stage; zona pellucida is disintegrating while the endometrium lining is proliferating (forming valleys called crypt). Apposition is when the blastocyst attached to the endometrium.
- Outer trophoblasts divide into endometrium (adhesion). Endometrium is also dividing
- Endometrium has blood vessels that are getting bigger. Trophoblasts are getting larger and they start to fuse (syncitiotrophoblast) + cytotrophoblast (the ones that used to be trophoblast).
- Synciotrophoblasts form villi and the endometrium is growing (which is uterine blood)
- Synciotrophoblasts that formed villi form fetal blood vessels – which are close contact to uterine blood. Lines inside of uterine cavity – placenta.

Germ Layer Derivatives

- Endoderm: GI tract tube (forms esophagus, small intestine, large intestine)+ lungs + liver + pancreas
- Mesoderm: form inner layers of skin, muscles, bones, cardiac muscles, kidneys, and bladder, ovaries/testes
- Ectoderm: outer layer of skin, sweat glands, hair skin, nervous system

Gestation

- Conception: don't use. Bad term.
- Gestation: Divide it into months (9 months-10 months) or trimesters (3 months each) or divide into weeks (10/20/30/40 weeks). Weeks is best/scientifically accurate/useful
    - Time 0 = Last menstrual period – LMP
    - Fertilization = week 2. Fertilization: egg + sperm genetic material combines
    - Embryogenesis – divided cells and have organ system formed. By week 10 = fetal development

- Birth at 24 weeks: 50% survival. After 23 weeks - rate of less complication decreases
- Birth at 40 weeks= full term (term: 37-42 weeks). Before 37 (preterm) after 42 (postterm). Complications at both pre and postterm.
- End of gestation - birth

Major Motor Milestones

- Children come into the world with **Reflexes:** Pre-programmed motor skills. Involuntary motor movement/automatic.
- Over time, there are voluntary movements that developed. This happens quickly.
  - 2-4 months: heads up/chests up
  - 2- 5months: roll over
  - 5-8 months: sit up
  - 5-10 months: stand with support (furniture/people)
  - 6-11 months: pull up to standing position
  - 7-12 months: children are able to crawl
  - 7-13 months: walk while holding onto furniture
  - 10-14 months: Stand on their own
  - 11-15 months: walk alone
  - Skill can develop in a wide range of time. There are many individual differences. 50% will develop before, 50% after! (it's usually a median number that is given)!

Motor Development

- Nature vs Nurture
  - Nature: Maturation. Genetic factors/anatomical/neurophysiological/biological traits that drive development. Identical twins walk on the same day; children all over the world develop motor skills in the same time and same order. Blind children tend to show same timing and progression of motor development.
    - Infants need to have muscles that are developed to walk or to have bowel control.
  - Nurture: Environment/culture influence. Back sleeping = reduce SIDS chances (sleeping on back makes it so children take a longer time to start crawling). Diaper = baby walk around a bit later.
- Gross vs fine motor skills
  - Gross motor skills: legs/arms. Develop before.
  - Fine motor skills: color picture/cutting with a scissor
- Head to toe development: Baby can lift head before they can crawl.
- You can speed up motor milestones a bit. Provide space/time to allow children to practice. Lots of toys = motor milestones are quickly achieved.
- Child can develop some motor skills more quickly than others.

Neonatal Reflexes

- Newborns – not much conscious control over their body. They have some motor skills (reflexes – automatic involuntary responses) that allow a baby to interact with the world:
    - Permanent reflexes: Important for newborns and also present throughout life
        - Breathing reflex – inhalation and exhalation
        - Eyeblink reflex – involuntary blinking of eye when something comes near head/bright light
        - Pupillary reflex – constrict pupil when bright light
        - Swallowing reflex – swallowing food happens automatically
    - Neonatal Reflexes: These disappear as a baby ages. Some are survival reflexes (help us live) while others might be evolutionary holdovers or precursors. Help doctors assess if something is not developing correctly.
        - Rooting reflex: Check stroking = baby turns head. Allows for orientation to mothers nipple or bottle. Disappears in few weeks of life – then baby turns head voluntarily
        - Babinski Reflex – how baby will turn/unturn toes when bottom of the foot. Disappears before 12 months. (fans toes outwards).
        - Monro reflex – startle reaction. Fan out arms then back. Disappears in 4-6 month of age.
        - Tonic Neck Reflex (aka fencing posture)– how when a baby's head is turned, the arm on that side straightens while the arm on the side that is opposite bends. Disappears at 6 months of age.
        - Galant reflex: when Skin is stroked, baby moves/swings to the side it was stroked. Disappears at 6 months.
        - Palmer grasp reflex: children closes their hands on anything that comes in their palm. Disappears at 3-4 months, then child grasps things voluntarily
        - Sucking reflex: How a baby will suck on any object that is placed in its mouth. Disappears at 3-4 months
        - Stepping reflex: Hold an infant upright and their feet touch a flat surface, they will start to step as if they are trying to walk. Disappears in first two months.
        - Swimming reflex: infants in water move legs/arms in a swimming motion. Involuntarily hold breaths. Allows a small infant to swim/float for a short period of time. Disappears at 6 months of age.
    - In adults – reappearance of prenatal reflexes in adulthood means that the adult has a serious medical problem!

Physical Development in Adolescence

- Adolescence: Transition period between childhood and adulthood.

- Means different things for different cultures. In cultures where children go to school for a few years and then find jobs as teenagers they don't have an adolescence period.
- In western culture: it's a new idea.
- Adolescence starts at sexual maturity and ends at independent adult status (being self-supported)
- Adolescence begins with **puberty**: a 2 yr long of sexual maturation (end of which you can reproduce). Start time Males – 13 y/o. Females – 11 y/o (approximates). Can start earlier/later depending on individual.
    - Puberty milestones/landmarks: males (first ejaculation – 14 y/o). Females (first menstrual cycle – 12/13 y/o).
    - Physical changes:
        - Development of **primary sex characteristics** (testes male and ovaries in female). Genitalia in both genders.
        - Secondary sex characteristics (related to sexual development but not required). Males – change in voice/growth of body hair, growth spurt. Females – breasts/hips. Both genders – pubic hair/underarm hair
        - Sequence of changes are same but the timing is not the same in all individuals. Depends on height, weight, and individual.
        - Social effects of timing of puberty
            - Males: Early puberty boys have both negative and positive consequences
                - Positive: stronger/taller (more athletic) popular/independent.
                - Negative: increase delinquency and alcohol use.
            - Females: Only negatives
                - Negative: teasing, sexual harassment. Out of synch with friends in interests

Brain Changes During Adolescence

- During adolescence there is a change in many structures. Specific changes include changes in: Prefrontal cortex, limbic system, corpus collosum. Global changes: Changes occurring throughout the brain
- Specific changes:
    - Prefrontal cortex is developed during adolescence. Responsible for higher order cognition (thinking about future, planning, decision making, ability to inhibit certain behavior and focus on long-term goals). Develops into early 20s. Explains why teenagers show poor judgement.
    - Limbic system –

        - Amygdala – responsible for emotions/emotional responses. Explains why teenagers are moody and have emotional outbursts (yelling at parents, slamming door)
        - Hypothalamus – regulates endocrine system (hormones)
        - Limbic system also includes other structures, but these top two are important.
    - Corpus Collosum: connects right/left hemisphere. Changes to connections associated with language/language learning. These connections develop until puberty.
- Global Changes
    - Increase myelination (faster communication of neurons- faster connections b/t brain areas)
    - Increase in brain volume in early adolescence and then decrease later in adolescence. **Synaptic pruning** – breaking down connections between certain neurons. Focus resources on the ones we use the most. What we do during our teenage users – shapes us for life. What we spend our time doing = what is reinforced.

Behavior and Genetics

Temperament, Heredity, and Genes

- **Behavioral Genetics**: looking at genetic component (heredity component) or hardwiring component to behavior.
    - **Heredity** – passing traits from parents/ancestors to offspring through genes.
        - **Traits**: distinguishing qualities and characteristics that compose us. Our attributes. Ex. Our temperament or our eye color.
            - **Inherited traits** - Inherited traits are qualities that are passed down from parents to children, like eye color, hair color, and height.
            - **Acquired traits** - Acquired traits are learned traits that come from experience with a person's environment.
    - We have approx. 20,000 -25k genes. Our traits are controlled by our genes.
        - **Genes:** Individual units of heredity. Segments of DNA (deoxyribonucleic acid) that are capable of synthesizing a protein. DNA contains all the instructions of our development and in the function of our organisms and in the function of who we are. DNA is our genetic-material. Many of these genes (units of heredity material/DNA pieces) are linked together to form a long straight of DNA called a chromosome. As humans we have 46 chromosomes full of genes to make up who we are (23 from mother/23 from father). These chromosomes reside in almost all cells of

body in the nucleus of the cells of our body. Refer to collection of genes compiled in chromosomes as our genome.

- Eye color or hair color (simple traits) can be linked to specific genes. We can see which genes are controlling these simple traits easily. Mendelian monogenic inheritance patterns refer to traits that are associated with a single gene and are associated with simple traits.
- There are more complicated / complex traits (happiness, aggressiveness, intelligence, characteristics of our behavior) that are controlled by/characterized by groups of genes. Those groups of genes are interacting with each other or the environment. The genes can be active or inactive. Environment plays a role in activating/inactive. Complex traits are associated with groups of genes and can follow Mendelian polygenic inheritance patterns.
    - Ex; tea bag = genes , water = environment, expression of tea is dependent of water. It is difficult to separate to what degree our genes and our traits effect our behavior.
- Simple traits interact minimally with the environment, whereas complex traits are more impacted by environmental influences.

- **Temperament** – broader than personality. It's their characteristic emotional reactivity, intensity, - their shyness and their sociability. Temperament seems to be established before babies are exposed to environment. **Persistent** as person ages.
    - There is a differences between children, not all people have the same as temperament. Babies/children's/people have different ways they respond to environment/parents. Ex. One Baby can be relaxed (easy), another irritable/tense (difficult) and another can show flat affect (withdrawn). We can differentiation babies in other ways as well.
        - The withdrawn person is more likely to be withdrawn as an adult.
    - *Temperament is hard-wired into us at birth! And persistent as we age.*
- **Personality**, unlike psychological characteristics/abnormalities is believed to be **constant** over a person's lifetime.
    - Is our personality hard-wired and persistent as we age? What about our gender identity? or intelligence?

Twin Studies and Adoption Studies

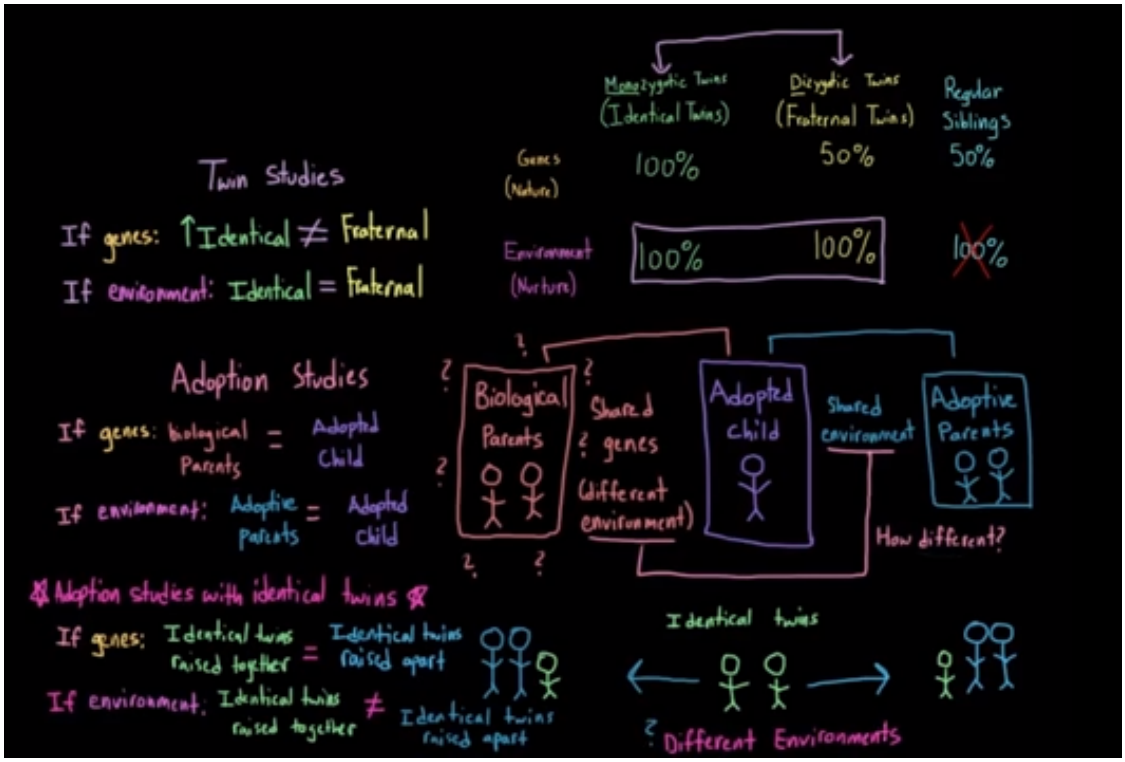
- Important in behavioral, social, and health sciences
- Allows us to tease apart **nature** (what we inherit from our parents, DNA) and **nurture** (our environments – our surroundings, peers, where we live)
- Classical twin study – compare monozygotic + dizygotic each raised in same household
- Monozygotic twins (identical) vs. dizygotic twins (fraternal)
    - Monozygotic Twins – egg splits into 2 after fertilization. Share 100% of genes, genetically identical.

- Dizygotic Twins – develop from 2 separately fertilized eggs. Share 50% of genes, like regular siblings.
- Both share same environment in womb, and also share same parents. Both types of twins eat the same food at the same time. So both can be said to share 100% environment.
- Regular siblings don't share 100%, similar environments, but can vary depending on parenting/age. More similar environments between each other than someone random, but parents change their parenting style for each kid and one of the siblings experiences different environments before the other sibling is born.
    - Siblings might have different friends and have different teachers in school. Twins have a much higher similar environments for all of these reasons.

- Ex. What causes schizophrenia?
    - Nature – genetic component
    - Nurture – environmental component
        - Ex. You can find a correlation between a parent and a kid having schizophrenia but it could be entirely possible that there is only a nurture (environmental component) such as something in the water.
    - Goal of researchers is to isolate genes and the environments. Look at one without the other to see what causes the disorder.
        - Monozygotic twins vs. dizygotic twins – can hold environment constant. Examine effect of genes.
            - If schizophrenia was genetic, we would expect to see different rates in identical vs. fraternal twins. Higher in identical twins.
            - But if environmental, similar rates of disorder in both sets of twins. Wouldn't matter if they were identical vs. fraternal. They share 100% of the environments.
- *Problems with twin studies:* identical twins treated more similarly than fraternal twins are. This would mean that monozygotic twins share even "more" of same environments than fraternal twins.
- **Adoption studies** – adopted child is compared to biological family and their adopted family. Biological parents have shared gene to an adopted child but the parents (or other twin who grew up with biological parents) will have markedly different environments
    - If environmental factor plays a big role, the adoptive child would be similar to adoptive parent and dissimilar to parents.
    - If genetics is a predominate player, the adoptive child would be similar to biological parent and not the adoptive parent. .
    - *Problems with adoption studies*: incomplete info about biological families for adoptive children. Also adoption isn't random, adoptive family sometimes matched to be similar to the biological family (of having the same community or

culture). Makes it more difficult to understand if something is genetic or environmentally driven.

- Adoption and Twin studies can be combined is great to study disorders- if they have a genetic or nature component! Identical twins adopted by different family – genetically similar, different environments.
    - If rates between Identical twins raised together = Identical twins raised apart would be an indicator that genes play a factor
    - But if rates between identical twins raised together is not equal to identical twins raised apart = strong environmental component
- But again, families who adopt are usually similar (not as different of an environment as we might suspect). Adoptive parents tend to be wealthy, have similar environments to child's biological parents.
- Recap. When comparing rates to determine if something has a strong environmental or genetic component:
    - Strong genetic component:
        - Identical twins =/= Fraternal Twins
        - Identical twins raised together = Identical twins raised apart
        - Adoptive child = Biological parents
    - Strong Environmental component:
        - Identical twins = Fraternal Twins
        - Identical twins raised together = /= Identical twins raised apart
        - Adoptive child = adoptive parents



Heritability

- **Heritability:** Variability of traits can be attributed to differences in genes.
    - Percentage of variation of traits due to genes
    - Heritability estimates define the amount of variance that can be attributed to genes in specific subgroups of individuals.
- Assume we say heritability of intelligence (a trait) is 50%. NOT saying that intelligence is 50% genetic, saying that the difference in intelligence is 50% attributable by genes.
    - Ex. Four boys with a 100% controlled environments, yet IQ still is different between the boys. Difference couldn't be attributed to environment, so we'd say their IQ differences were 100% heritable because environment was 100% same.
        - Heritability = h^2. So h^2 = 99% /0.99 … Close to 100%/1
    - Alternatively you can say 4 identical quadruplets (genetically identical), but completely different environments. Since variability can't be due to genes, must be environmentally-determined. Therefore, h^2 = 0%/0.00
    - Heritability increases in following: As environments becomes more controlled, differences in behavioral traits are tied to heritability. Secondly, more genetic variation leads to greater heritability.
        - ex. Fraternal quadruplets, w/ way more different phenotypes. the differences are tied to the genes/heritability as well if environments is kept constant

        - In heritability we are talking about the relative contributions of genes to behaviors or traits.
    - Heritability is dependent on population that is studied. Heritability is specific to the population studied and would likely be different in different environments.
- Heritability *does not* describe the amount of individuals with a specific gene or disorder.
- Heritability is *not* a broad estimate of nature versus nurture in a general population.
- Minnesota Study:
    - Religiosity in monozygotic twins has a coefficient of correlation value of 0.49 based on the Minnesota twin studies reared apart data.
    - Personality in monozygotic twins has a coefficient of correlation value of 0.50 based on the Minnesota twin studies reared apart data.
    - Information processing speed in monozygotic twins has a coefficient of correlation value of 0.56 based on the Minnesota twin studies reared apart data.
    - Intelligence in monozygotic twins has a coefficient of correlation value of 0.69 based on the Minnesota twin studies reared apart data.

Regulatory Genes

- **Molecular Genetics –** a new field of science that looks at the molecular structure and function of genes. As we study gene and environments interaction we are getting to understand specific gene that is regulating our behavior. We are looking at specific parts of DNA
- Watson & Crick discovered structure of DNA, and gave rise to **central dogma** of molecular genetics. Segments of DNA codes for RNA (ribonucleic acids). Units of RNA (called codons) will code for 1 of 20 amino acids, and eventually become building blocks of proteins, which affects our behavior.
    - Proteins form the intermediate point between our genes and our behavior (body functioning/response to environments)
    - Now, studies are saying that the genes don't play as large of a role.
        - Example. Steroids (environmental factors) /hormones effect our behavior. [Reminder: Steroids that produce different responses in our body is an activation of genes to produce proteins]. Pheromones do the same thing (environmental/outside factors) that are causing a response (turning on genes) that result in a function. This is a switch from central dogma a bit (which is DNA→ RNA → proteins to now a bit of the reverse, some of the environments is now effecting our proteins)
    - Gene Regulation: modulatory world of gene expression (gene expression modulated by environmental factor). Greatest achievements in clarifying the modulatory factors we have had mapped our entire genome - **gene mapping** of all genes on the 46 chromosomes. Because of genome now we can look at populations which share traits and not have to rely on twin/adoption studies to narrow down heritability of traits. Now, we can look at population of shared

traits and look at genes that code for those traits and compare/contrast those genes.
    - Scientists who study gene mapping look at populations with shared traits and compare their genetic profiles. They also may look at damage to DNA in a person's genome.
- We can now look at genes that may contribute to a trait, and compare and contrast. We found that a vast majority of our genes, 95% don't code for proteins, but regulate how proteins are coded (when and how it is expressed). [Ex. If we experience sugar consumption, then we code for the protein hormone insulin].
- Called **epigenetics** – changes to gene expression resulting from changes other than to gene/DNA sequence. Ex. Addition of methyl groups to the gene, which make it more difficult for TFs to come in and activate gene. [Methylation inhibits activation of certain genes.]. Epigenetics can override our behavior.
    - Epigenetics is the study of changes in gene expression that results in something other than changes to a DNA sequence. One epigenetic change is methylation, which can make it more difficult for a gene to be expressed.

Gene Environment Interaction

- Nature vs. nurture.
- **Gene-Environment Interaction:** Gene + environments effect our Behavior, and the role of genes + environments on behavior is dependent on each other. [Explains Nature through nurture]
    - Ex. Attractive baby and hideous baby. As a result, attractive baby receives more attention and is more sociable and well adjusted. But say both have genes that predispose for depression, that are triggered/activated by environment (stressors). Beautiful baby's genes are not activated because it has reduced transmitters, while ugly baby's genes are making proteins all the time since his life is tougher. Both DNA/genes play a role in genetic disposition but also environments plays a role.
- Another example is **phenylketonuria (PKU)**, caused by mutations to a gene that encodes a liver enzyme phenylalanine hydroxylase (PAH). But because enzyme is missing, amino acid phenylalanine doesn't get converted into tyrosine. A genetic condition that causes a build-up of phenylalanine which then cause brain problems. (1 in 15k babies effected, but most babies are unaffected).
    - Symptoms of PKU can be managed by a specific diet, which is a less problematic environment for the individual with PKU.
        - During infant screening, placed on these effected individuals placed on phenylalanine-free diet, and most grow up without major problems.
    - Gene + environments = initiate bodies behavior.
        - The expression of PKU is dependent on the environment.
        - Even though PKU is highly heritable, it is still modifiable and can be managed via the environment.

- A study that looks at the interaction between genetic predisposition and environmental events is looking at gene-environment interaction, not epigenetics.

Adaptive Value of Behavioral Traits

- **Function of behavior** – to keep **homeostasis** - a maintained of a constant internal condition. Behavior is coordinated internal and external response of an organism/groups of organisms to their environment. Functioning in the realm of **adaptation** to help maintain our homeostasis.
- **Ethology** focuses on the observation of animal behaviours, call these **overt** behaviours (not necessarily obvious, just means *observable*).
    - *Innate behavior, learned behavior, and complex behaviours.*
- **Innate** behavioural traits – genetically programmed behavior. present at birth and requires no experience with the environment. Have the following characteristics:
    - *Inherited* – innate behaviours are encoded by DNA
    - *Intrinsic* – present even if you're raised in isolation. Ex. Pooping, peeing, etc.
    - *Stereotypic* – performed the same way each time.
    - *Inflexible* – not modifiable by experience.
    - *Consummate* – fully developed right away, at first performance. Not influenced by experience.
        - *Subject to change through mutation and recombination, natural selection etc (just like all other physical traits)*
        - Ex. Nausea in women during pregnancy helps them avoid toxic foods/novel-strongly flavored food in critical period of development. Thought of as *programmed.*
    - 3 main types of innate behavior:
        - **Reflexes** - Sensory and motor nerve loop response w/o thinking. (ex. Knee-jerk response.
        - **Orientation Behaviors –** regulating specially in our environments
            - Ex. Kinesis, our change in speed (orthokinesis), change in rate in turning (klinokinesis). Can be in response to a stimulus (like tripping on a sidewalk – your body would change speed/kinesis).
            - Ex. *Positive taxis* and *Negative taxis* - , movement towards/away from stimulus respectively. Ex. Insects and light. Insects have positive taxis towards light (phototaxis)
        - **Fixed-action pattern (FAP) –** sequence of coordinated movement performed without interruption. Similar to a reflex, but more complicated. Ex. Praying mantis. Any prey-sized movement praying mantis experiences elicits a strike response, once strike initiated – can't be changed/altered at all.
- **Learned** behavioural traits – persistent changes in our behavior that result from our experiences. ot present at birth, but is acquired after experience with the environment. Have the following characteristics:

    - *Non-inherited* – acquired only through observation/experience
    - *Extrinsic* – absent when animals are raised in isolation, ex. social skills
    - *Permutable* – pattern/sequence that is *changeable*
    - *Adaptable* – capable of being modified in response to changing conditions
    - *Progressive* – subject to improvement or refined through practice over time
- **Complex** behavior – combination of innate and learned behavior. Relationship between genes and environment in adaptation. Can be a spectrum, most behaviours fit between innate and learned.
    - Ex. ability of insects to fly, starts off as innate but through learning become more efficient in ability to fly.
- Genes/environments forms behavior and they also contribute to the adaptive role of these behaviors!
- **Covert behavior** - Covert behavior is behavior that is not observable.

Motivation and Attitudes

Physiological Concept of Positive and Negative Feedback

- **Positive feedback** – process that increase production of product. One product stimulates production of another product. Ex. Domino or chain effect
- **Negative feedback**, rate or process that needs to be controlled to decrease product. Ex. In our body!
    - Negative feedback is put into place to inhibit production of product.
- Ex of positive and negative feedback in females:
    - Hypothalamus (releases GnRH) → pituitary (posterior – back, anterior –front (releases LH) → ovaries (releases estrogen, progesterone)
    - Ovaries release estrogen. GnRH releases from hypothalamus and LH from pituitary. Ovaries release estrogen, positive feedback to hypothalamus, positive feedback to anterior pituitary and positive feedback to estrogen. Cycle continues. Eventually when estrogen
        - Estrogen → GnRH → LH → progesterone released from corpus luteum after ovulation when LH too high. Progesterone triggers negative feedback to GnRH/LH which turns off entire positive feedback process. How we maintain balance in our body.

Instincts, Arousal, Needs, Drives: Drive-Reduction and Cognitive Theories

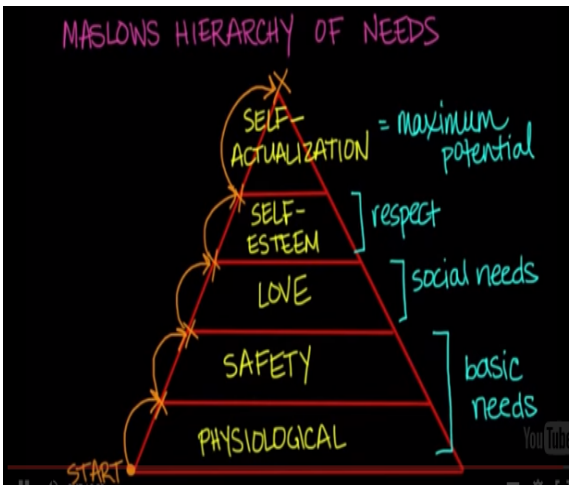
- Complex human experiences involve motivation. Motivation asks the question why? Why do we do we think and feel the way we do?
- ***Motivation*** *has 5 schools of thought/approaches::*
    - **Evolutionary** Approach– role instincts play in motivation. What do humans do to survive? What is not-learned and just instinct.

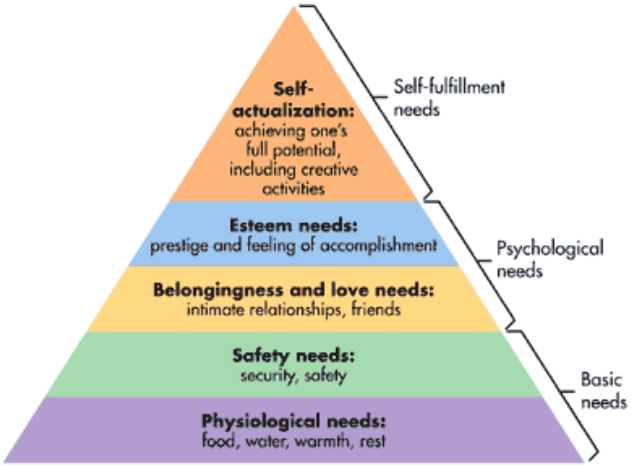
        - Ex. Think about baby, cries, sleep, eat. Basic instincts that all humans have.
    - **Drive Reduction Theory** / Drive Theory– focuses on *drives vs. needs*.
        - **Need** is lack or deprivation that will energize the drive, or aroused state.
        - That **drive** is the aroused state. Fulfilling the drive will reduce the need. This need-drive balance is what maintains homeostasis. *Typically basic, essential, and physiological*
        - Ex. You are at the gym and need for water. Trainer says you need to do more exercise. In this example, need: water, drive: thirst. Doing push ups is means to fulfill drive for water.
    - **Optimum Arousal Theory** – people want to reach full arousal/alertness. Drive to get full arousal, and natural high – a state we enjoy. Ex. Why people go to amusement parks.
    - **Cognitive** – (rational and decision making ability) - thought processes drive behavior. Ex. Light bulb going off in one's head.
    - **Maslow's Hierarchy of Needs** – we want to satisfy needs in particular order. Why we use a pyramid.
- In reality, all approaches/schools of thought of motivation are related and help us learn motivation a bit better.
- **Id**- innate. The reservoir of all psychic energy. The id seeks to discharge tension arising from internal needs or external stimulation. It is made up of all instincts and wants to get rid of all uncomfortable feelings. (This is called a "Drive Reduction Theory").
    - **"The pleasure principle"**- To gain pleasure or avoid pain. To accomplish this it uses: -*Reflex actions* (for instance sneezing) -*Primary Processes* (Forming a mental image of the desired object) - *Wish fulfillment*- The image of your desire which temporarily restores comfort.
- **Ego**- "The Reality Principle" - Operates on secondary processes. (Reality testing) Mediates the demands of reality vs. the desires of the Id. The self. This is who we identify with/believe ourselves to be.
- **Superego**- The internalization of cultural ideals and parental sanctions. "Morals" Interjection/Internalization. The Superego inhibits Sexual and Aggressive impulses, and tries to replace reality with morality, striving for perfection. The Superego has subsystems: - The Conscious - what you should not be "wrong" - The Ego Ideal - what you should/want to be "right"
    - If you think about this theory, its the classic angel(super-ego) and devil (id)on the shoulder telling you what to do. It is up to you to decide (ego), but if your conscious self (ego)is weak, you'll end up having one of the other two take over- leading to an imbalance. This is why psychoanalytic therapy focuses on raising the intrapsychic conflicts to the conscious level.
- Motivation Terms:
    - The incentive theory of motivation calls attention to how factors outside of individuals, including community values and other aspects of culture, can motivate behavior.

- **Extrinsic Motivation:** Extrinsic motivation is associated with rewards or obligated behavior. Extrinsic motivation is motivation to do something based on an external reward (like money or fame).
- **Intrinsic Motivation:** internal motivation
- **Drive-reduction motivation** is motivation based on the need to fulfill a certain drive, like hunger or thirst.
- **Amotivation** - Amotivation is the lack of motivation.

Maslow's Hierarchy of Needs

- Abraham Maslow's Hierarchy of Needs - A pyramid. We have needs that must be fulfilled from bottom to top. *These needs must be fulfilled in a specific bottom → top order.*
  - Basic needs are most fundamental and at bottom.
  - There are 5 needs.
    - ***Acronyms: Please Stop Liking Stupid Shit***
    - **Please Safely Love (OR) Else Suffer**
- 1. **Physiological** – food, water, breathing, sleep. Essential to survive. *Basic need*
- 2. **Safety** – safety of employment, health, resources, property. Can only be fulfilled after physiological needs are met. *Basic need.*
  - **Safety needs are associated with stability, security, protection, and freedom from threats.**
- 3. **Love –** need to belong, acceptance from friends/family intimacy, love. *Social needs/Belonging*
- 4. **Self-esteem –**feel confident and sense of achievement, recognition, competence of skill. *Respect.*
- 5. **Self-actualization** – one reaching their maximal potential, achieving the most one can be. They were moral to their own principles and mastered the other needs. Differs from person to person. Different from person to person. *Maximum Potential*
  - *One can want to be ideal-parent, or ideal athlete or ideal-artist*




Self-actualization: achieving one's full potential, including creative activities
Esteem needs: prestige and feeling of accomplishment
Belongingness and love needs: intimate relationships, friends
Safety needs: security, safety
Physiological needs: food, water, warmth, rest
Self-fulfillment needs
Psychological needs
Basic needs

Incentive Theory

Acronym: ILSE (incentive theory) POSTIVELY READ (positively reinforces)

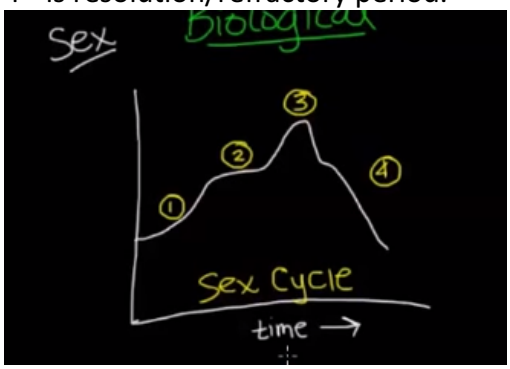
- **Incentive Theory -** Reward, *intangible or tangible* is presented after the occurrence of an action w/ intention of causing the behavior to occur again. This causes a positive association and meaning toward a behavior. Focuses on conditioning/incentive to make a person happier. Incentive theory argues that individuals are motivated to engage in behaviors that produce rewards or incentives.
    - Ex. doing well at work and getting promotion (tangible). Or intangible - job satisfaction.
    - Ex. Incentive for football team is winning a game and getting recognition.
- Studies have shown that if a reward is given immediately, chance of it happening again is higher.
- If person isn't rewarded, they are less likely to do again.
- Rewards must be obtainable for them to be motivating. Can't be impossible to achieve. If impossible to get, someone becomes less motivated.
- **Incentive theory** focuses on **Positive reinforcement** is done through continuous positive stimulation. A positive reinforce is given after a response to increase the response. You need to be constantly given positive reinforces.
- A **negative reinforcement -** removal of a stimuli to encourage a response would, is not what incentive theory is focussed on. (this was **drive-reduction theory**)
- Skinner, most distinguished incentive theory psychologist said person will more likely do action that's positively received, and less likely to do action that is negatively received.
- As children we are given incentives from parents – incentive theory at work!

Biological and Sociocultural Factors – Food, Sex, and Drugs

- Many factors that affect/ regulate our intake of *food, sex, and drugs.* 2 categories that regulate food, sex, and drugs are: **biological factors** (hormones and brain regulates each

drive by controlling them automatically and unconsciously) **and socio-culture** (our conscious choices on how we express our needs) factors

- Food (eating)
    - Biological:
        - Lateral Hypothalamus (LH, acronym: One with missing LH – Lacks Hunger, so normal functioning LH controls that we start eating. You'd be skinny like an "L"). In normal conditions, LH sends positive signal to us to start eating. .
        - Ventromedial Hypothalamus (VMH, acronym: when one is missing- Very Much hungry, you'd be fat like a O in ventrOmedial), so when functioning properly, it signals to us to stop eating. Lectin present in high amounts in blood when full (appetite suppressing hormone)
        - Another hormone is insulin. Brain can detect level of insulin to see amount of sugar and fat store in blood. Too much insulin = lots of sugar/fat store.
        - Metabolism rate. In dieting we get a slowdown in metabolism. Makes it easier for people to gain weight when resuming normal eating.
        - Genetic predisposition to our weight, set point influenced by parents.
    - Sociocultural:
        - We Eat for different *occasions, time, desire, appeal, availability*
- Sex (sexual response) --
    - Investigated by Master & Johnson (Acronym: MJ loved Sex). They studied 100s of male and female volunteers during sexual activity. They measured the physiological indicators and they turned the results into the **Sexual response cycle.**
    - Biological:
        - **Sexual response cycle.**
            - First part of cycle is *excitement phase*, marked by increased heart rate, muscle tension, BP, etc.
            - Second is *plateau.*
            - Then 3rd - orgasm.
            - 4th is resolution/refractory period.



            - M&J also noted sexual drive/activity was related to testosterone for women and men (sexual activities increased testosterone which in turn increased the sex drive).
        - Also have genetic predisposition to sexuality, and found by looking this by studying at homosexuality.
    - Sociocultural:
        - varied sexual response due too: *age, cultural background* (certain practices acceptable in certain cultures but not others), *stimulus (*determined by how responsive we are to visual/tactile stimuli), *emotions* (psychological influence), and *desires* (to procreate or not).
    - Hormones:
        - Prolactin is related to sexual gratification and is associated with relieving sexual arousal after an orgasm.
        - Endorphins produce feelings of euphoria and pleasure, and are released post-orgasm.
        - Oxytocin is released after an orgasm to facilitate bonds and feelings of connectedness between sexual partners.
- Drugs
    - Biological:
        - Genetic: family member or family history/genetic predisposition – then you have a higher chance of abusing the drug.
        - withdrawal and cravings,
        - biochemical factors – imbalance in our brains
        - Drugs like marijuana and heroin mimic neurotransmitters of our brain. Cocaine causes the abnormal release of natural NTs like **dopamine** – affects our limbic system.
            - Dopamine overstimulates/activates our brain limbic system (which controls movement, emotion, motivation, pleasure). Why we perceive emotions and mood altering properties of drugs. We become in a state of euphoria – total happiness.
                - If we continue to use a drug, we abuse the drug. **Reinforcing effect** – we want to constantly stimulate the brain by using drugs.
    - Socio-culturally: curiosity, novelty of drug, rebel, poor control of user, cope with stress, low self-esteem (remember: one of Maslow's Hierarchy of needs, right below self-actualization), relief from fatigue, feel good, and more prevalent in areas of higher poverty

Components of Attitude

- What is attitude? **Attitude** - A *learned tendency* to evaluate things in a certain way. To evaluate people, issues, events, objects. (We think of attitude as a moody teenager, or someone having certain attitude towards a certain topic).

- We can break down attitude into 3 components. These components shape our attitude.
    - **Affective** (emotional) – we may feel or have emotions about a certain object, topic, subject.
        - Ex: I am scared (an emotion) of spiders is an emotional attitude and shapers our attitude about spiders.
    - **Behavioural** - how we act or behave towards object/subject
        - Ex; I will avoid (action/behavior) spiders and scream (action/behavior) if I see one. Influence our attitude.
    - **Cognitive** component -form thoughts/beliefs, and have knowledge about subject/topic that will influence and shape our attitude (perhaps prior knowledge that will help you shape attitude). Their cognitions.
        - Ex: I believe spiders are dangerous (We have a belief they are dangerous) which forms our attitude.
- Called the **ABC model of attitude**
- Example 1: "I love yoga because I get to mediate and I believe it helps me relax so I will go to class each week." – 'I love yoga' is emotional,' I believe it helps me relax' is cognitive, and behavioural is 'I will go to class each week'
- Example 2: "I am frightful of rollercoasters and believe they are stupid so I will be on the carousel." Affective – 'I am frightful', behavioural is 'I will be on the carousel', and cognitive is 'I believe they are stupid'

Attitudes Influence Behavior

- 4 theories that answer question: *how do our attitudes influence behavior.*
- 1. **Theory of planned behavior**
    - Intentions + Implications: We consider our **implications** of our actions before we decide on how to behave. The best predictor of our behavior is the strength of these **intensions** and implications.
    - Intensions are based on 3 things:
        - Our **attitudes** towards a certain behavior (ex. I like/favor studying),
        - **Subjective norms** - what we think others think about our behavior (ex. My friends think studying is a waste of time)
        - **Perceived behavioural control** (how easy/hard we think it is to control our behavior) ex. I also have to work 40 hours this week on top of studying.

          In this example: Our attitude is positive, but our behavior of studying is low!
- 2. **Attitude to behavior process model (Attitude → Behavior)**
    - An event triggers our attitude (something that will influence our perception of an object)
    - Then attitude + some outside knowledge (what regarded as appropriate behavior) together determines behavior.

- Ex. Tommy has attitude that junk food is unhealthy, because many of his relatives have heart related diseases associated with poor eating habits. So when he's at home he does not eat chips/soda/candy because of his knowledge that these foods are bad for his health and maintains a healthy lifestyle no matter where he is.
    - unhealthy attitude (trigged by an event) + knowledge leads to behavior

- 3. **Prototype Willingness Model (PWM)**
    - *Behavior is a function of 6 things, the combination of which influence our behavior. Our behavior is a function of….*
        - Past behavior
        - Attitudes – explained in Attitude to behavior processing model above. Attitude → behavior
        - *Subjective norms* – what others think about our behavior
        - Our *intentions* – our behavior intentions
        - Our *willingness* to engage in a specific type of behavior
        - *models/prototyping* – a lot of our behavior is carried out from prototyping/modelling.
- 4. **Elaboration Likelihood Model for Persuasion (ELM)**
    - More *cognitive approach* – focuses on the *why/how of persuasion*.
    - 2 ways in which information is processed:
        - Central Route of Persuasion: The degree of attitude change depends on quality of the arguments by the persuader. How much we are persuaded depends on quality of persuasion. ARGUMENT/Words are central!
        - Peripheral Route of Persuasion: looks at superficial/expertise/non-verbal persuasion cues, such as attractiveness/status of persuader. The doctor himself is peripheral (he is the one delivering the words!)

          Ex; if a drug rep comes to your medical practice and tries to convince their version of a drug. Subconsciously we will be looking at quality of arguments, if they can market drug better than another company/representative and how well they present patient risks. How engaging they are, their experience with the industry. Their knowledge of the company, how well they look. We process all these cognitively and shape our attitude towards our company and ultimately our behavior.
- People strive for consistency between their attitudes and behaviors. You wouldn't hold attitude and then display a behavior that conflicts the attitude ex. You wouldn't say eating meat is immoral and then have a positive attitude towards eating hamburgers.
- People are more likely to be honest when social influences are reduced (ex. secret ballot), when general patterns of behavior are observed versus a single one (**principle of aggregation**), when specific actions are considered, and when attitudes are made more powerful through self-reflection.

Behavior Influences Attitude

- Is it possible for our behaviours to shape our attitudes? Yes.
- Strong social pressures can weaken attitudes to behavior connection (talked about in last video) and can cause our attitudes to follow our behavior.
- 1. **Foot in the door phenomenon**
    - We have a tendency to agree to small actions first. Eventually over time comply with much larger actions.
    - Basic concept of how people are brainwashed too. Door is eventually pushed completely open over time.
    - Society behaviors strongly feed into your attitude.
- 2. **Role-playing**
    - Everyone plays many roles in life (we wear lots of hats, ex: we can be a brother/sister, a son, a student, etc). Now, picture yourself in a new role (ex: parent, new job). First few days in the role feel a bit strange/fake because we're trying to follow social quota in that role. We are trying to fit the role and sound professional. *But over time, what feels like acting starts to feel like you.*
        - Our behavior of playing this rule influences our attitude overtime. What feels like acting starts to feel like you and begins to fit your attitude!
        - Ex. Playing role as a student now becomes normal, playing role of a parent becomes normal over time. Our behavior became part of us.
    - Changed attitude as a result of our behavior and carrying out that role.
    - Ex. Zimbardo's Stanford prison experiment
- Also **public declarations** (more likely to follow through if you've told everyone), and **justification of effort** (people do something they don't want to justify effort they put into it, such as going to med school after working so hard)
    - **Effort justification** is an idea and paradigm in social psychology stemming from Festinger's theory of cognitive dissonance. **Effort justification** is people's tendency to attribute a greater value (greater than the objective value) to an outcome they had to put **effort** into acquiring or achieving.
- Door in the Face Phenomenon:

Cognitive Dissonance Theory

- **Cognitive Dissonance:** Cognitive Dissonance is the *discomfort* experienced when holding 2 or more conflicting cognitions (ideas, believes, values, emotional reactions).
- These conflicting ideas lead to feelings of discomfort which we want to alleviate. These conflicting ideas can be alleviated by alterations in our beliefs/behaviours. We want to reduce the discomfort by minimizing the dissonance/inconsistencies/ **CONTRADICTIONS**
- 4 things we do to reduce that Cognitive Discomfort. The examples to explain this concept a bit better will be one of a smoker who smokes. Ex: Smoker says "I smoke" (cognition 1) and now learns that "smoking leads to cancer" (cognition 2). In light of this new information, four things might occur:

    - 1. **Modify our cognitions** – Change/alteration in the cognition (thinking process) in a person's action/behavior to reduce the discomfort a person has with that attitude/behavior.
        - ex. smoker might say, I really don't smoke that much. (went from "I smoke" to "I really don't smoke that much")
    - 2. **Trivialize** – make less important/make trivial, change the importance of their cognition
        - ex. Smoker might say, evidence is weak that smoking causes cancer.
    - 3. **Add** – adding more cognitions, to make contradictions more comfortable.
        - ex. I exercise so much it doesn't matter (cognition 3). You added another cognition to deal with cognitive dissonance.
    - 4. **Deny –** denying the facts,
        - ex. Smoker might say, there is no evidence that smoking and cancer are not linked.
- Key point: People strive for harmony in our thoughts, actions, and words. As soon as our cognitions, our attitudes and behaviours don't align, we have *cognitive dissonance.*
- We modify our cognitions to reduce cognitive discomfort, we don't change our behavior.
    - Behavioral change is not usually achieved successfully with "shock" or "scare" tactics, and they do not necessarily create dissonance.
    - Passive or educational strategies do not typically create dissonance.
    - Selective exposure would most likely refer to avoidance o reduce dissonance.
    - Post-decision dissonance often follows an impulsive purchase that is difficult to return.
    - When someone does something and there is minimal justification for them doing it, this creates more dissonance than if they can explain it through a significant rationale. The dissonance then acts to make them internally justify the action, saying 'I wanted to do it anyway because I like doing that sort of thing.'
    - Change vs compliance – small rewards change cognitions, large rewards – just compliance
    - Minimum Justification Principle - When someone does something and there is minimal justification for them doing it, this creates more dissonance than if they can explain it through a significant rationale. Can occur after buying something you didn't want too.
    - Need to introduce a new cogitation to create cognitive dissonance – this is best done through action of the participant which affirms a second cognition. (new information would NOT do this…as a cognition needs to be developed and internalized)

Situational Approach

- **Situational Approach to Behavior:** We are placed in new situations every day. These situations affect our behavior. Under the branch of social psychology

- **Social psychology** – a branch of psychology that analyzes the situational approach to behavior and emphasizes influence of social phenomena and people interactions with each other on influence. It focuses on interaction between individual and the changing external environmental (situational) circumstances over internal traits/internal motivations/ stable personality traits.
    - Focuses on interactions between individual and their environment.
    - One situation is not predictive of how someone will act in another situation. Depending on situation the behavior might change.
- People behave differently depending on their situation – **externa**l instead of internal.
    - As human we judge person on just one instance of behavior (internal).
- Hard to predict behavior based off 1 situation. Have to acknowledge we sometimes behave differently. CANT JUDGE A BOOK BY ITS COVER
- **Attribution** is the process of inferring *causes of events/behaviours.*
    - Attribution can either internal *or external*, our focus will be on external.
    - Everyday, we make tons of attributions on environment, our own behavior, and those around us
    - Inference a person is behaving a certain way based on situation they're in.
    - 3 main parts of external attribution: consistency, distinctiveness, and consensus
        - **Consistency** (does person usually behave this way),
        - **Distinctiveness** (does person behave differently in different situations), and
        - **Consensus** (do others behave similarly in situation?).
            - If person behaves different in different situations (distinctive) and others behave similarly in the same situation (consensus) then we know the behavior is due to the situation (external). Situation is effecting behavior.
    - If person is *consistent* in all situations, then maybe not external/environment, and more internal. Their behavior is not dependent on situation.
        - Ex. Situation matters. Your friend behaves differently to snakes at a zoo (where snakes are caged) than to a snake in her living room (where snake might be a danger).
        - If we see someone in more circumstances, we find out more about them as a person.
- To determine the attribution of a behavior, one must determine if the behavior is consistent. Does the person typically behave this way? One must determine if the behavior is distinctive. Is this behavior different than it would be in other situations? Finally, one must determine if the behavior has consensus. Do others behave the same way in similar situations?

Theories of Personality

- No theory is dominant to another or mutually exclusive. All are different ways/theories on how personality develops in people and all come from different branches of psychology and are from perspectives of different theorists/psychologists.

xSituational Approach

See Above

Psychoanalytic Theory

- **Sigmund Freud** was a neurologist and went to study hypnosis, but this turned him to medical psychopathology. Psychiatry/psychology as we knew it was unknown before his work.
- **Psychoanalytic theory** – says personality is shaped by childhood experiences person's unconscious thoughts/desires, feelings, and past memories (particularly *experiences in childhood*).
- Personality has memories, beliefs, urges, drives, and instincts that we are not always aware of that make up the unconscious. Says childhood experiences and **unconscious desires**
    - 2 instinctual drives motivate human behavior:
        - **Libido -**natural energy source – fuels energy of mind for motivation for survival, growth, pleasure, etc.
        - **Death instinct** - drives aggressive behaviours fuelled by unconscious wish to die or hurt oneself/others
- Individual influences on behaviour: **projection** (projecting own feelings of inadequacy on another), **reaction formation** (defence mechanism where someone says or does exact opposite of what they actually want/feel), **regression** (defence mechanism where one regresses to position of child in problematic situations), **sublimation** (defence mechanism where unwanted impulses are transformed into something less harmful).
- Central to his theory is **libido**. Libido is natural energy source that fuels the mechanisms of the mind.
    - When this energy is stuck/fixated at various stages of **psychosexual development**, conflicts can occur that have lifelong effects.
    - **Fixation** at a particular stage is what predicts adult personality.
    - Ex. someone fixated at oral stage (first stage) might have oral personality characteristics, such as smoking habits/overly talkative when they grow up.
- Freud said there were 3 parts of the mind: These three parts are the id, ego, and superego (ACRONYM: **I**mmature **E**ntertainer **S**ydney). They exist in either the unconscious or conscious mind.

- **Conscious mind**: top of iceberg is the **conscious** part of mind (small, tip of the iceberg), These are the mental functions you are aware of.
- **Unconscious mind** is the bottom part of the iceberg is the larger part of the mind (most of the mind is unconscious just like most of an iceberg is beneath water). Consists of primitive, instinctual wishes and information that cannot be accessed.
    - Not to be confused with **Subconscious mind/precocious mind:** consists of information that becomes accessible once you direct your attention to it (memory recall for example).
- Imagine an iceberg.
- 1) **Id** at the bottom, it's the unconscious part. It develops after birth and demands *immediate* gratification.
- 2) **Ego** – part of conscious and unconscious. Involved in our perceptions, thoughts, and judgements, and seeks *long-term* gratification.
- 3) **Superego** – develops around age of 4, and it's our moral conscience. Also part of conscious and unconscious minds.
- Our libido impulses are what want to be gratified – when overgratified or partially/not gratified at all, fixation occurs at a certain stage. Face conflict/anxiety. It's a conflict between these 3 mental structures – ego, id, and superego. They're all competing for demand, so in conflict.
    - Ex. Id is on one shoulder and it's not getting immediate gratification, then we have superego on other shoulder, preaching to id about what's moral, and ego is in middle.
    - Id wants gratification, and is going back and forth with superego, so ego here is trying to gratify the id but it also has to take into account what the superego is saying. It's moral oversight.
    - The ego is part of the conscious and unconscious mind, so it acts as mediator between the unconscious desires of the id and the moral demands of the superego. (just remember superego is also conscious and unconscious as well)
    - Ex. a **Freudian slip** is example of mental conflict. Ex. financially stressed patient, please don't give me any bills – meant any pills.

- Freud's stages of psychosocial development is a process all individuals go through and is a part of personality development. Especially problematic when there's a problem with development at a particular psychosocial stage.

xMaslow's Hierarchy of Needs

- See above

Humanistic Theory

- The **humanistic theory** (developed by **Carl Rogers)** focuses on healthy personality development, and humans are seen as inherently good. The most basic motive of all

people is the **actualizing tendency** (**self-actualization**), innate drive to maintain and enhance oneself to full potential. It also says that people have **free will.** Person will grow towards self-actualization as long as there are no obstacles.
    - Answers; "Who am I"
- Primary difference between Freud's psychoanalytical theories is Freud's theory was deterministic – behaviour is determined by unconscious desires.
- Humanistic Theory focuses on the **conscious**, and says people are **inherently good**, and we are **self-motivated to improve** (so we can reach **self-actualization**). (Freud theory focuses on mental conflicts (fixations))
- First theorist of the humanistic theory was Abraham **Maslow**, who formed hierarchy of needs. Must first fulfill physiological needs of pyramid and work our way up, then safety, then love, self-esteem, and finally self-actualization.
    - Self-actualization is rarely achieved, only 1% of people ever reach it. Self-aware, caring, wise, and interests are problem-centered. They have a higher purpose that is focused on larger causes and less about basic aspects of life. They are striving to think of larger causes. Average person seeks to self-actualize but we don't achieve it.
- **Carl Rogers** is a humanistic theorist says qualities Maslow described are nurtured early in life, self-actualization is a constant growth process nurtured in a *growth-promoting climate*. In order for this climate to help someone reach self-actualization, 2 conditions that need to be met:
    - Growth is nurtured by when individual is **genuine.** One has to be open and revealing about themselves without fear of being wrong.
    - Second is growth is nurtured through **acceptance** – unconditional positive regard from others. This allows us to live up to our ideal selves. Allows us to be open and learn without fear of others looking at us differently if we do something wrong. Ex. Parent might yell at child but still love their child.
    - Genuine relationship with others and acceptance is what allows us to *live up to our real self.*
        - **Ideal self**: we can't live up to that is bounded by conditions.
    - (**HUMANIST MASLOW ACTUALIZES, HUMANIST ROGERS ACCEPTS).** Humanistic Rogers genuinely believes that people can actually reach self-actualization through self-actualization.
- Both Rogers + Maslow:
    - Central feature of our personality is **self-concept** - achieved when we bring genuineness and acceptance together to achieve growth-promoting climate.
    - When there's discrepancy between conscious values and unconscious true values leads to tension, must be resolved.
    - Genuine + acceptance = self-concept
    - Importance of **congruency** between self-concept and our actions to feel fulfilled.

Biological Theory

- Many variations to this theory, some relate to the **brain** and some to **behaviour** (the evolutionary psychology approach) instead of traits
    - Ex. A dominant Psychological (behavioral) biological Theory by **Buss**: Evolutionary psychology theorizes that males + females have different mating strategies that influence costs associated with passing on genes. Males can have many mates, females more selective due to cost of pregnancy.
- The **biologic theory** suggests important components of personality are **inherited**, or determined in part by our **genes**.
- **Hans Eysenck** proposed extroversion level is based on differences in the reticular formation (controls arousal and consciousness)– introverts are more aroused than extroverts so they seek lower levels of stimulation.
- **Jeffrey Alan Gray** (Biopsychological theory of personality) proposed personality is governed by the behavioural inhibition (punishment/avoidance) and activation (reward) system. (acronym: 50 shades of Gray is based on punishment/rewards)
- **C. Robert Cloninger** linked personality to brain systems in reward/motivation/punishment, such as low dopamine correlating with higher impulsivity. (acronym: Clone-iger cares about them brain systems – Clone the Brain)
- Researchers always try to look at identical twins, because used to tease out environmental vs. genetic characteristics – same genetic makeup. aka: We look at identical twins because they have the same genetic makeup. We look at twins who grew up in different environments and they still had similar personalities – similar traits.
    - Results show even if twins reared separately, still had similar personalities (traits) which shows strong genetic component. Some traits showed a weak genetic component (twins had different personalities when studied in different environments)
    - **Social potency** trait – the degree to which a person assumes leadership roles and mastery of roles in social situations. Common in twins reared separately.
    - **Traditionalism** – tendency to follow authority also shown to be common in twins.
    - **Weaker genetic traits** – **achievement, closeness**
    - Specific genes that relate to personality, people with longer **dopamine-4 receptor** gene are more likely to be thrill seekers.
    - But of course, just because you have gene doesn't mean you'll express it – depends on environment as well.
    - **Temperament** – innate disposition, our mood/activity level, and is consistent throughout our life.
- Important takeaway – our inherited genes to some degree leads to our traits, which leads to our behaviour/personality.

Behaviourist Theory

- The **behaviourist theory** says personality is the result of learned behavior patterns based on a person's environment – it's **deterministic**, in that people begin as blank states and the environment completely determines their behavior/personalities. Do not take thoughts and feelings into account. Environment → BEHAVIOR
- Focuses on **observable** and measurable behaviour, rather than mental/emotional.
    - The psychoanalytic theory would be the most opposite of this theory (focuses on mental behaviour).
- 1. **Skinner** – strict **behaviourist**, associated with concept of **operant conditioning**. Uses rewards/punishment to increase/decrease behaviour, respectively.
- 2. **Pavlov** – associated with **classical conditioning**, ex. Pavlov dog experiment. Places a neutral stimulus with an unconditioned stimulus to trigger an involuntary response. Ex. ringing a bell in presence of food causes dog to start salivating.
    - People have consistent behaviour patterns because we have specific response tendencies, but these can change, and that's why our personality develops over our entire lifespan. Constantly evolving and changing.
- What connects the observable (behavioral) to mental approach (psychoanalytic) approach? The **cognitive theory**, a bridge between classic behaviourism and other theories like psychoanalytic. Because cognitive theory treats thinking as a behaviour, and has a lot in common with behaviour theory (Albert Bandura comb)

Trait Theory

- A **personality** trait is a stable predisposition towards a certain behavior. Straightforward way to describe personality – puts it in **patterns of behavior**. Description of traits instead of explaining them.
- **Surface traits** are evident from a person's behavior, while **source traits** are factors underlying human personality (fewer and more abstract).
- What is a trait? A relatively **stable characteristic** of a person that causes individuals to **consistently** behave in certain ways. Combination and interaction of traits forms the personality.
- Myers Briggs Personality Test – Carl Jung - 4 letters that characterize you in one of 16 personality types. There are a set of traits/behaviors based on these!
    - **ESTJ**: extraversion (E), sensing (S), thinking (T), judgment (J)- (Acronym: **E**ast **ST**. **J**ohns High school)
    - **INFP**: introversion (I), intuition (N), feeling (F), perception (P) (Acronym: **I N**eed the **F**eeling of **P**ain)
- 1) Gordon **Allport** – all of us have different traits. Came up with list of 4500 different descriptive words for traits. From those he was able to come up with 3 basic categories of traits: **cardinal traits**, **central traits,** and **secondary traits**. Individuals have a subset of traits from a universal set of possible traits.

    - **Cardinal** traits are characteristics that direct most of person's activities – the dominant trait that influence all of our behaviours, including secondary and central traits.
    - **Central** trait - Less dominant than cardinal. ex. honesty, sociability, shyness.
    - **Secondary** trait – preferences or attitude. Ex. love for modern art, reluctance to eat meat.
    - *Acronym:* ***A Cardinal named Allport Can Sing (Central, Cardinal, Secondary) .***
- 2) Raymond **Cattell** – Proposed we all *had 16 essential personality traits* that represent basic dimensions of personality. Turned this into the 16 personality factor questionnaire (**16 PF)**. (Acronym: 16 Cattell)
- 3) Hans **Eysenck** – We all poses all traits which we express to different degrees. (Allport said we have diff unique subsets, while Eysenck says we all have them but just express them in different degrees)
    - Eysenck says we have *3 major dimensions of personality*, which encompass all traits we all possess, but the degrees to which we individually express them are different. We all express varying degress of neuroticism and extraversion, but we all don't necessarily have psychoticism. These 3 are:
    - **Psychoticism** -degree to which reality is distorted.
    - **extroversion** (vs. introversion) – degree of sociability
    - **neuroticism** -emotional stability
        - We do not all necessarily have psychoticism.
    - Use acronym: PEN (Eysenck's PEN)
- 4) **5 Factor Model (Big 5 Personality Traits)** – found in all people of all populations.
    - **Openness** - independent vs. conforming, imagining vs. practical),
    - **Conscientiousness** - careful vs. careless, disciplined vs. impulse, organized or not
    - **Extroversion** – talkative or quiet, fun loving or sober
    - **Agreeableness** - kind vs. cold, appreciative vs. unfriendly
    - **Neuroticism** - stable vs. tense, calm vs anxious, secure vs. insecure
    - Use acronym **OCEAN**
- Cattell, Eysenck, and Big 5 all use **factor analysis** – a statistical method that categorizes and determines major categories of traits. Allport's theory did not, he used different methods.
    - Factor Analysis: Reduces variable and detects structure between variables. We get a final classification of personality after the factor analysis.

Observational Learning: Bobo Doll Experiment and Social Cognitive Theory

- Observational learning (aka social learning/vicarious learning) is learned through watching and imitating others – such as **modeling** actions of another.
    - **Mirror neurons** found that support this.
    - *Aggression is environmentally learnt and mass-media can have an performance effect (performance is situationally dependent depending on If the actor is rewarded or punished)*

- **Social Cognitive Theory** (originally called social learning theory) is theory of behaviour change that emphasizes interactions between people and their environment. Unlike **behaviourism** (where environment controls us entirely), cognition is also important.
    - Social factors, observational learning, and environmental factors (ex. opinions/attitudes of friends and family) can influence your beliefs.
- **Albert Bandora** studied it – and did the **Bobo Doll Experiment**. Cited when people debate if they should ban violent video games. It's a blow-up doll you can punch. **BOBO AL**
    - Had group of children doing arts and crafts, but in middle of it suddenly man appeared and started hitting this inflatable Bob doll. Also screaming "kick it, hit it, etc". Did for 10 minutes straight. Some children observed the behavior, others weren't fazed.
    - Then man left, and researchers gave kids an impossible puzzle to solve to frustrate the children. Researchers brought into the room Researched how the kids reacted to frustration. Many children would come up to the doll and hit it, and ones hitting it were yelling kick it, hit it – the same words as the man whom they learned the behavior from. Revealed that kids can observe and learn from it.
    - Why people use this to argue to ban violent games and movies.
    - But learning behavior vs. performing it is different. Many of the kids were aggressive to the doll, others weren't aggressive. So how come some kids different? Did the other kids learn the behavior?
    - Did second experiment, set up TV that showed a bobo doll and someone being aggressive to it. But difference here was video showed afterwards that person was punished. Some of the kids again walked up to bobo doll and hit it. What about kids that didn't?
        - Researchers bribed kids, offered them stickers/juice if they imitate behavior. Kids were able to imitate the aggressive behavior. Concept called **learning-performance distinction** – learning a behaviour and performing it are 2 different things.
        - Not performing it doesn't mean you didn't learn it!
- Am I motivated to learn something?
    - **Bandura's Social Cognitive Theory - A**ttention, **M**emory, **I**mitation, **M**otivation. Acronym: "**AM I Motivated?"**
    - Ex. Want to teach you to draw a star. In order to learn it, need a long enough attention span, the memory to remember it, and be able to imitate it. Question is, are you motivated enough to do it? If you are, you do the action (draw the star).

Defense Mechanisms

- **Defence Mechanisms:** -ways to protect ourselves – a psychological shield against anxiety or discomfort of unconscious psychological processes. A way to protect

ourselves when we have to deal with unconscious wants, feelings, desires, and impulses.

- Classified into four categories: Pathological mechanisms, immature, neurotic, and mature.
- **Pathological Defence Mechanisms** - distort reality
    - **Denial** – person pretends something hasn't happened. Most important defence mechanism. (acronym: PATHOLOGICAL liar/denier)
        - **Ex**; if someone has breast cancer, they just deny the fact that they do.
- **Immature Defence Mechanisms:**
    - **Projection** – throw your attributes to someone else – like accusing another person of being jealous when you are the one being jealous. (acronym: saying PP is immature (Projection and Passive Aggression)
        - Can cause **projective identification** – that person targeted with projection can starting believing, feeling, having thoughts of the attributes that were projected to them Ex. The person now actually feels jealous and the person can believe "I am a jealous person"
    - **Passive Aggression** – aggressively doing something for someone and failing to do it or doing it slowly. Passive way to express your anger.
- **Neurotic Defence Mechanisms:**
    - (acronym: 3RID)
    - **Intellectualization** – taking intellectual aspects and detaching to the emotional aspects of the situation. Separating emotion from ideas
    - **Rationalization** – making yourself believe you were not on fault – avoids blame to oneself. Can have false logic or false reasoning.
    - **Regression** – acting like a baby in some situations ex. throwing temper tantrum, start whining.
    - **Repression** – unconscious process where thoughts pushed down to unconscious
    - **Displacement** – person anger at someone but displaces it to someone else (a safer target).
        - Ex: mother who is mad at her husband gets mad at her child
    - **Reaction Formation** – unconscious feelings that make person to complete opposite.
        - Ex. A mother who bears an unwanted child, for example, may react to her feelings of guilt for not wanting the child by becoming extremely solicitous and overprotective to convince both the child and herself that she is a good mother.
        - Ex: a person who doesn't like immigrants might start to volunteer at an immigration center
- **Mature**
    - Acronym: Mature HASS
    - **Humor** – expressing humor/jokes to be truthful and alleviate feelings but make them socially acceptable.

- **Sublimation** – channeling negative to positive energy. Ex. Violent energy, instead of expressing violence you become a boxer. Transform into socially acceptable behaviors.
- **Suppression** – *conscious* thought get pushed to unconscious but can access thoughts at a later time.
- **Altruism** – in service of others – we feel fulfilled and gain pleasure/satisfaction.

Freud – Death Drive, Reality Principle, and Pleasure Principle

- **Freud outlined the pleasure principles and the reality principle**
- **Pleasure Principle:** As a young child (or if you are immature) you want to immediately feel pleasure to avoid suffering. Not willing to compromise.
  - **Ex.** I want the candy now
- **Reality Principle:** When we become mature, you need to sacrifice short term reward and replace it with long term gratification. Not always going to get what you want and the outside world might tolerate your behavior. You have to play by the roles of the real world and might have to compromise. "Play your role in the real world"
  - **Ex.** taking candy may get you in trouble.
- Both Reality and pleasure principle fill the task of gratification. With reality principle you might have to wait for gratification (may be a delay).
- We have several **drives:** intrinsic, universal feelings we all have towards varying things.
- Examples of drives:
  - **Eros Drives**: **Life Drive.** Like health, safety, sex. Comes with love, cooperation, collaboration. Working with others to promote your and others wellbeing
  - **Thantos: Death Drive**. Self-Destructive/Harmful to Others. Comes with Fear, anger (inward or outward), hate.

Psychological Disorders

Mental Disorders

- **Mental disorders**- disorders of the mind. Mental Illness, psychological/psychiatric illness. Abnormalities of the mind that cause distress or disability. Sometimes can shorten someone's lifespan (suicide or other negative effects)
  - **Definition of Distress**: Distress is a negative type of stress that builds over time and is bad for your body. It happens when you perceive a situation to be threatening to you some way (physically or emotionally) and your body becomes primed to respond to the threat.
  - **Eustress** is a positive type of stress that happens when you perceive a situation as challenging, but motivating. Eustress is usually enjoyable!
  - **Neustress** is a neutral type of stress. Neustress happens when you are exposed to something stressful, but it doesn't actively or directly affect you. For example, news about a natural disaster on the other side of the world may be very

stressful, but your body doesn't perceive that stress as good or bad for you so you aren't affected.

- Major public health problem, affects the higher functions of the brain including cognition, emotion, or consciousness, mood, and **behaviour**.
- **Biomedical** vs. **biopsychosocial models**.
    - **Biomedical** = focuses on biological, physical abnormalities.
        - Ex. Abnormalities of cell of the brain that might cause disorders or having abnormal pattern of connections b/w cells of the brain
    - **BioPsychoSocial** = also considers abnormalities and might be useful for cause or classification of mental disorder but also includes psychological and cultural/social factors that might be useful for cause or classification of mental disorder.
- Difficult to categorize mental disorders because there are no brain tests/scans/blood tests. Diagnosis is made clinically by symptoms and signs, time course, risk factors, and epidemiology.
- 2 classification systems: ICD-10 and DSM-5. Similar but not the same.
    - **ICD-10** is International Classification of Diseases, 10th revision. System from the WHO (World Health Organization).. 11 top level categories
    - **DSM-5** is Diagnostic and Statistical Manual of Mental Disorders, 5th edition, from the American Psychiatric Association (APA).20 top level categories.
- According to the National Institute of Health (NIH), each year in the USA about 25% will meet criteria for 1 mental disorder, and 6% will have a serious mental illness that causes severe disability/distress. Some people have more than 1 mental disorder at a time.

Categories of Mental Disorders

- Types of mental disorders – enormous #, many with overlapping features.
- Not due to use of medication, drugs, other medical conditions, etc. Also cultural differences. In these cases it will be attributed to the specific cause.
- Usually causes **distress/disability**. Key point because person who's unusual/eccentric /weird is not mentally ill/not somebody who has a psychological disorder.
- We'll go through DSM-5
    - 20 top-level categories. There is an "other" category for each as well.
    - 1. **Neurodevelopmental Disorders** – involve distress/disability due to abnormality in development of nervous system. Includes intellectual disability, autism spectrum disorders, and ADHD.
        - Autism spectrum disorder is characterized by a variety of issues related to social and communication abilities, and first symptoms of the disorder typically include delayed language development and unusual communication patterns.
        - Specific Learning Disabilities: All specific types removed from DSM V
            - The specific learning disorder dyslexia (reading difficulty) is characterized by problems with accurate or fluent word

recognition, poor decoding, and poor spelling abilities. (Not Included in DSMV)
        - Dyscalculia – mathematics learning disorder. Removed
        - Dysgraphia – writing disorder – removed.
    - Developmental coordination disorder is characterized by difficulties in acquiring and coordinating motor movements.
- 2. **Neurocognitive Disorders** – Loss of cognitive/other functions of the brain after nervous system has developed. Big categories within this, one is delirium (reversible episode of cognitive/higher brain problems, many causes – drugs/abnormalities in blood/infections). Dementia and its milder versions are usually irreversible and progressive (usually caused by Alzheimer's disease or stroke).
- 3. **Sleep-wake Disorders** result in distress/disability from sleep-related issues. Include insomnia and breathing-related sleep disorders, abnormal behaviors during sleep.
- 4**. Anxiety Disorders** – distress/disability from abnormal worry/fear. Some are specific to certain stimuli like phobias, while others are not specific to certain stimuli, including *generalized anxiety disorder*. Panic disorder involves panic attacks (intense anxiety)
    - Social anxiety disorder a false cognition leads to a fear of humiliation, embarrassment, rejection, negative evaluation, or rejection by others.
        - Selective mutism is an anxiety disorder characterized by difficulty speaking in social situations, but the individual is developmentally normative in terms of their language and communication ability.
    - General Anxiety Disorder: Individuals with generalized anxiety disorder experience excessive and persistent worry or anxiety regarding many different spheres of life that cause distress, impairment, or maladaptive behavior.
- 5. **Depressive Disorders** – distress/disability from abnormally negative mood. Mood refers to long-term emotional state. (Mood is not emotion, mood is more long term and not necessarily related to events). Mood is also subjective experience person has of their experience.
    - **Mood** (how someone feels such as sad) becomes **affect** (how mood is displayed to others - person crying). Hopelessness, loss of enjoyment in activities. High risk of suicide.
- 6. **Bipolar and Related Disorders** – abnormal negative mood, but these may have periods of abnormally positive mood called mania
    - Mania is characterized by little sleep, talking quickly, making bad decisions due to impaired judgement, making bad decisions based on bad assessment of risk or abilities of a task. Can leads to social/legal problems.
- 7. **Schizophrenia Spectrum and other Psychotic Disorders** - involves distress/disability from *psychosis*. Psychosis involves delusions (fixed false beliefs

not explainable by experiences/culture ex. Ones thoughts are controlled by someone else or "I have superpowers"), hallucinations (sensory perceptions without any stimuli ex. Hearing voices w/o stimuli). With psychosis *disorganized thinking* can occur and negative symptoms (decreased emotional expression, decreased motivation, decreased social behavior). Schizophrenia has many of these features while other psychosis disorders have some.

- 8. **Trauma/Stressor-Related Disorders** - distress/disability form occurs after stressful/traumatic events. Leads to mood, emotional, and behavioral abnormalities.
    - Ex: Post-traumatic stress disorder, common after wars, or other traumatic experiences (natural disasters/rape)
- 9. **Substance-Related and Addictive Disorders** – distress/disability form the abnormal use of substances that affect mental function. Include alcohol, caffeine, cannabis, hallucinogens, inhalants, opioids, sedatives, hypnotics, anxiolytics, stimulants, tobacco, others. Can cause mood abnormalities, anxiety symptoms, or psychosis. Also includes gambling,
- 10. **Personality Disorders** – distress/disability related to personality. Involves long-term mental and behavioural features that are characteristic of a person, huge spectrum of personality types considered acceptable from a culture. Personality disorders involve ones outside those accepted of societal norms. Cluster A odd/eccentric (weird), Cluster B intense emotional/relationship problems (wild), Cluster C is anxious/avoidant/obsessive (worried)
- 11. **Disruptive, Impulse-Control, and Conduct Disorders** – distress/disability from behaviors that are unacceptably disruptive or impulsive for someone's culture. Inability to control inappropriate behaviours
- 12. **Obsessive-Compulsive and Related Disorders** – distress/disability from obsessions or compulsions.
    - **Obsessions** – thoughts that occur involuntarily, often unwelcome. Occur repeatedly.
    - **Compulsions** are activities that one must do and are often related to an obsession.
    - Ex. obsession with hands being dirty, compulsion to wash them many times a day.
- 13. **Somatic Symptom and Related Disorders** - Distress/disability from symptoms similar to those that may occur to illness unrelated to mental disorder, but of psychological origin with or without having a general medical condition at the same time.
    - Example is someone that has abdominal pain, caused by psychological disorders such as stress without any physical signs.
- 14. **Feeding and Eating Disorders** – distress/disability from behavioural abnormalities related to food,
    - ex. Anorexia nervosa (takes in insufficient amounts of food), bulimia nervosa (binge eating then purging (induced vomiting)).

- 15. **Elimination Disorders** – distress/disability from urination/defecation at inappropriate times or places.
    - Ex. Urinary accidents
- 16. **Dissociative Disorders** – distress/disability from abnormalities of identity or memory.
    - Ex: Multiple personalities, people who have lost memories for part of their lives.
- 17. **Sexual Dysfunctions** – distress/disability from abnormalities in or performance of sexual activity.
- 18. **Gender Dysphoria –** distress/disability caused by person identifying as a different gender than society represents them as. Must cause distress/disability.
- 19. **Paraphilic Disorders –** distress/disability from having sexual arousal to unusual stimuli for a person's culture. Must cause distress/disability or if causes harm to another person, particularly people or a child who does not have decision making capacity for proper consent.
- 20. **Other Disorders** – distress/disability from any person that appears to have a mental disorder causing distress/disability but doesn't fit into other categories. Rare.

Schizophrenia

- Disorder of the brain but it has nothing to do with multiple personalities
- Combination of genetics and environmental (experience in the womb, childhood experiences) cause abnormalities in the brain.
- These abnormalities in the brain can be picked up by abnormal brain scans and neurotransmitters (high dopamine). Antipsychotic medicines reduce dopamine.
- None of the tests actually diagnose schizophrenia and is diagnosed by a clinical interview (history, hearing from the patient/family, and observing patient)
    - Why do we observe the patient? It causes changes in the patient's *behavior*.
        - The behavioral change can be changes in the way they **think** or **act**.
            - Differences in the way they think: abnormal beliefs (delusions), see/hear things (hallucinations)
            - Differences in the way they act: isolate themselves socially, disorganized, flat affect (lack emotion)
        - Lots of changes that are different
- 1% of people have Schizophrenia. Equal in males and females. Affects those who are 16-30 years old. Males are affected at a younger age than females.
- **Prodrome**: period of time before schizophrenia before symptoms are actually present.
    - Deterioration in person's behavior and functioning. Some of the signs of schizophrenia and one starts to go downhill.
        - Schoolwork suffers or work can suffer
        - Relationships might suffer (paranoia or suspiciousness towards other people)

        - Delusional ideas (people are working against me), start to act differently
    - Prodrome leads to schizophrenia
- Schizophrenia people have a higher risk of suicide, being homeless, and being in prison or in jail.
- Schizophrenia disorder recap: Brain disorder that is neurodevelopmental – combination of genetics and the environments. Can notice difference in brain scans but diagnosed via clinical interview. Affects how people act and preceded by a prodrome period. Decrease in functioning. Social repercussions of schizophrenia - stops people in engaging in society, high risk of suicide, incarceration (risk being in jail), homelessness
- **Haloperidol** is an antipsychotic medication used to treat schizophrenia.

Biological Basis of Schizophrenia

- Common long term mental disorder that causes a large amount of distress and disability.
- ***Prototype*** *of psychotic category of disorders.* Protoype of psychosis – specific abnormalities in cognition and perceptions of reality – hallucinations, delusions.
    - **Positive symptom: Hallucinations**-sensory perceptions w/o stimuli like hearing or seeing not there. Hallucinations are sounds or other sensations experienced as real when they exist only in the person's mind. While hallucinations can involve any of the five senses, auditory hallucinations (e.g. hearing voices or some other sound) are most common in schizophrenia. Visual hallucinations are also relatively common. Research suggests that auditory hallucinations occur when people misinterpret their own inner self-talk as coming from an outside source.
    - **Positive symptom: Delusions-** false fixed beliefs not explainable by a person's culture. A delusion is a firmly-held idea that a person has despite clear and obvious evidence that it isn't true. Delusions are extremely common in schizophrenia, occurring in more than 90% of those who have the disorder. Often, these delusions involve illogical or bizarre ideas or fantasies. Common schizophrenic delusions include:
        - **Delusions of persecution** – Belief that others, often a vague "they," are out to get him or her. These persecutory delusions often involve bizarre ideas and plots (e.g. "Martians are trying to poison me with radioactive particles delivered through my tap water").
        - **Delusions of reference** – A neutral environmental event is believed to have a special and personal meaning. For example, a person with schizophrenia might believe a billboard or a person on TV is sending a message meant specifically for them.
        - **Delusions of grandeur** – Belief that one is a famous or important figure, such as Jesus Christ or Napolean. Alternately, delusions of grandeur may involve the belief that one has unusual powers that no one else has (e.g. the ability to fly).

        - **Delusions of control** – Belief that one's thoughts or actions are being controlled by outside, alien forces. Common delusions of control include thought broadcasting ("My private thoughts are being transmitted to others"), thought insertion ("Someone is planting thoughts in my head"), and thought withdrawal ("The CIA is robbing me of my thoughts").
- Rare disorder with both biological and environmental etiology (cause/set of causes of a disease).
- 3 categories of symptoms of Schizophrenia: cognitive, positive, negative symptoms
    - **Cognitive symptoms**- abnormalities of attention, organization, planning abilities
        - disorganized thinking, slow thinking, difficulty understanding, poor concentration, poor memory, difficulty expressing thought, difficulty integrating thoughts, feelings and behavior
    - **Negative symptoms -** blunted emotions, loss of enjoyment "emotional abnormalities" refer to the absence of normal behaviors found in healthy individuals. Common negative symptoms of schizophrenia include:
        - **Lack of emotional expression** – Inexpressive face, including a flat voice, lack of eye contact, and blank or restricted facial expressions.
            - ***Affective flattening*** is the reduction in the range and intensity of emotional expression, including facial expression, voice tone, eye contact (person seems to stare, doesn't maintain eye contact in a normal process), and is not able to interpret body language nor use appropriate body language.
        - **Lack of interest or enthusiasm** – Problems with motivation; lack of self-care.
            - ***Avolition*** is the reduction, difficulty, or inability to initiate and persist in goal-directed behavior; it is often mistaken for apparent disinterest. (examples of avolition include: no longer interested in going out and meeting with friends, no longer interested in activities that the person used to show enthusiasm for, no longer interested in much of anything, sitting in the house for many hours a day doing nothing.)
        - **Seeming lack of interest in the world** – Apparent unawareness of the environment; social withdrawal.
        - **Speech difficulties and abnormalities** – Inability to carry a conversation; short and sometimes disconnected replies to questions; speaking in monotone.
            - ***Alogia,*** or poverty of speech, is the lessening of speech fluency and productivity, thought to reflect slowing or blocked thoughts, and often manifested as short, empty replies to questions.
    - **Positive symptoms**- "psychosis" - hallucinations, delusions (characteristic of psychotic disorders including schizophrenia) "perceptual abnormalities", disorganized speech/thinking, disorganized behavior, catatonic behavior

        - **Catatonic schizophrenia: Catatonic schizophrenia** is a type (or subtype) of **schizophrenia** that includes extremes of behavior. At one end of the extreme the patient cannot speak, move or respond - there is a dramatic reduction in activity where virtually all movement stops, as in a catatonic stupor.
- Our understanding of the cause of schizophrenia very limited. We have a limited understanding on how the limited mental functions occur.
- Patients of schizophrenia have the following physical abnormalities observed in the brain (via autopsy or scan examination of structure brain)
    - Based on autopsy and scan examination of structure brain, we see physical abnormalities in Schizophrenia brain:
    - Fluid filled regions have been enlarged because there is less tissue of the brain.
    - **Cerebral cortex** (layer that is outermost part of cerebrum) **seems to have decreased size**, in <u>frontal and temporal</u> lobes. These areas have to do with cognitive and perceptual functions which are abnormal in schizophrenia.
        - Organization of the Cerebral cortex (cortical layers) particularly in frontal and temporal lobes is disturbed. Typically there is a clear organization. Here, there is a disorganization and thinning of layers.
    - Based on activity studies (by scans that now look at brain activity)
        - Frontal and temporal lobe activity is also seen in same areas of structural/physical abnormality.
    - Abnormal development of brain is most likely what leads to this disease.
    - Some features of schizophrenia also involve **abnormalities in dopamine (increase)**. This dopamine plays a role in frontal/temporal lobes. Effects cognitive, emotional, perceptual functions.
    - A # of medications that affect dopamine transmission often improve symptoms
    - The **mesocorticolimbic** pathway Is affected
        - Meso = “midbrain” - where VTA (Ventrotangmental area). Specifically, the soma of neurons that use dopamine are located at VTA.
        - cortico = “cerebral cortex”, axons project to frontal and temporal lobe of cerebral cortex. (axons of the VTA neurons project to other areas of the brain and release dopamine to cerebrum areas).
        - limbic = “collection of structures inside of the brain” involved in emotions/motivations/etc.
        - Often divided into mesocortical pathway (VTA to the frontal lobe) and mesolimbic pathway (VTA to limbic structures)
        - Abnormal activity of mesocorticolimbic pathway. One way of thinking about schizophrenia is abnormal activity is mesocorticolimbic pathway leads to dysfunction in parts of frontal cortex that cause cognitive symptoms, and limbic structure causes negative symptoms, and abnormal activity in temporal cortex causes positive symptoms.
            - Abnormalities are likely much more complicated.

- Causes: genes, physical stress during pregnancy (such as infection during pregnancy), and psychosocial factors (negative family interaction styles effect development of brain)
    - Poverty and schizophrenia link. Causality is not well known.

Biological Basis of Depression

- Depression, a major Depressive Disorder: major cause of distress, disability, and death from suicide. *Prototype of disorder category of depressive disorders.*
- Related symptoms of Depressive mood: feelings of hopelessness, loss of interest in activities. Our understanding of cause of major depressive disorder is limited. No consistent abnormalities in brain tissues, but scans have suggested functional abnormalities in brains.
    - Areas with abnormal activity involve the **frontal lobe** and **limbic structures**. Decreased activity in frontal lobe and increased activity in limbic structures. Show a role in regulation of emotions and response to stress.
    - Ex. Stress hormones like cortisol are controlled by the hypothalamus, which communicates with limbic system and frontal lobe. Hormones affect the brain themselves too.
        - Communication of frontal lobe, limbic system, and hypothalamus may plays a role why there are abnormal hormones in the body.
        - Stress hormones affect most tissues of the body and the brain (including hypothalamus, limbic system, and frontal lobe)
            - Unclear which abnormalities of stress hormone are causes and which are effects of the disease.
- There are some studies that suggest abnormalities in neural pathways using certain neurotransmitters (molecules that communicate between neurons). Abnormalities in pathways cause abnormal increase or decrease activity in the brain. Collection of neurons have cell bodies in brain stem while axons project into frontal lobe/limbic system. One structure starts in the **raphe nuclei** of the brainstem responsible for **serotonin** release. Another pathway starts in the **locus coeruleus**, which sends long axons to cerebrum and releases **norepinephrine.** Also the **VTA** sends long axons to different areas of cerebrum, supplies **dopamine**.
- Medications that affect serotonin, NE, and dopamine often improve symptoms. Ex. monoamine oxidase inhibitors (increase amount of monoamines in synapse)
    - Monoamines include adrenaline (epinephrine), norepinephrine, dopamine, serotonin, and melatonin (involved in onset of darkness).
        - Catecholamine (Subclass) includes dopamine, norepinephrine, and epinephrine (2 OH groups on phenyl)
- Another newer idea is may be abnormalities of **neuroplasticity** - brain changes in response to experience. But unclear if neuroplasticity abnormalities is a cause or effect. Strength of information/efficiency of flow changes or connections change. Aspects of neuroplasticity appear to be abnormal in animals of major depressive disorder.

- May include genetics (predisposition can be inherited, increase risk of developing a response to negative or stressful event particularly early in life), but psychosocial factors can also be linked to major depressive disorder such as childhood abuse, stressful events or limited social support during adverse circumstances. So likely combination of biological and psychosocial factors.

Anxiety Disorders and Obsessive Compulsive Disorder

- 5 types
- **Generalized anxiety disorder (GAD):** describes a person whose general state is *tense and uneasy* to a degree it influences their life (don't eat well or are sleep deprived for example). This anxiety must last for *6 months or more.*
    - Identifiable physical symptoms: eyelids, twitching eyelids, trembling, fidgeting
    - Population it affects: women (2/3rd are women)
    - Source of anxiety: unclear
    - Can't identify the cause of their stress so they can't deal with it or identify it/cause
    - Can lead to high blood pressure and other bodily symptoms
    - Usually have also depression (not part of this disorder but can go along with it)
    - *Continuous high level of anxiety*
- **Panic Disorders**
    - Sudden burst of *sheer panic and intense fear.*
    - "Panic attacks" – sudden, intense. Might be in response to any stimuli
        - Heart palpitations or sweating or chest pain or shortness of breath.
    - Panic attacks are in response to situations that typically don't warrant that level of stress.
        - There are situations where a high level of panicking is appropriate ex. If you are being attacked by someone, someone breaks into your house.
    - There are physical symptoms as well.
- **Phobias:** irrationally afraid of specific objects or specific situation. *Focused anxiety*
    - Can be debilitating (ex. Phobia of leaving your home) or can have a normal life (ex. Phobia of snakes)
    - Tend to form a pattern. People tend to have phobias of specific subtypes of things typically
        - Generally associated with fear of animals, insects, blood, heights, or enclosed spaces. These are common but there are more.
        - People get by by avoiding the source of their phobia
    - Social Phobias: Fear of different social situations. not as easy to avoid.
        - Ex; shyness, or intense fear of being scrutinized by other
        - People avoid talking to people or places where they might be judged or situations that might lead to embarrassment
- **OCD**
    - Characterized by obsessions and compulsions

- Obsessions: Unwanted repetitive thoughts
- Compulsions: Unwanted repetitive actions
- These obsessions and compulsions persistently interfere with everyday life. Ex. Continuously watching your hands through multiple times throughout the day to the point your skin becomes rock.
    - For normal people, once you perform the action the worry goes away and doesn't interfere with your life. The worry doesn't continue to occupy the brain. Ex. Checking if door is locked, or washing your hands shortly after touching something gross.
- Common obsessions: dirty, bad future (something terrible is about to happen, ex. Someone in your family is about go get sick to the point that they don't think about other things), need for symmetry (feel uncomfortable unless things around them are ordered to the point they continue thinking about it ex. A book is slanted and you think about it till you fix it, if you don't something bad will happen)
    - Remember: these must invade your everyday life and the obsessions are an extreme.
- Common compulsions: washing (intense need to wash hand, to bathe, or groom), check doors/appliances (constantly/repeatedly), movement ritual (feeling the need to repeatedly sit down/stand up, leave room and come back, tap on a desk).
- 2-3% of people. Typically, teen and young adult.

- **Post-Traumatic Stress Disorder (PTSD)**
    - When a person have lingering memories and nightmares about a past event that it impact them in daily life (haunting/bad memories/repeated nightmares) Includes physical symptoms like insomnia
    - Have a trigger that leads to the disorder.
        - Ex. Soldiers coming home from the war, survivors of terrible accidents, violent/sexual assault victims, natural disaster victims.
    - Described as PTSD if symptoms persist for over 4 weeks after an event.
        - Ex. A normal person might have a nightmare after something terrifying but these nightmares stop/become infrequent after some time. For someone with PTSD they don't stop.
    - Acronym:
        - **Posttraumatic stress disorder**
          TRAUMA
          Traumatic event
          Re-experience
          Avoidance
          Unable to function
          Month or more of symptoms
          Arousal increased

- **Repressed memories /memory** are hypothesized memories having been unconsciously blocked, due to the memory being associated with a high level of stress or trauma. The theory postulates that even though the individual cannot recall the memory, it may still be affecting them consciously. The existence of repressed memories is a controversial topic in psychology; some studies have concluded that it can occur in victims of trauma, while others dispute it. According to some psychologists, repressed memories can be recovered through therapy. Other psychologists argue that this is in fact rather a process through which false memories are created by blending actual memories and outside influences. Furthermore, some psychologists believe that repressed memories are a cultural symptom because there is no written proof of their existence before the nineteenth century.[2]
    - **Some believe that they can be "recovered"** years or decades after the event, most often spontaneously, triggered by a particular smell, taste, or other identifier related to the lost memory, or via suggestion during psychotherapy.

Dissociate Identity Disorder

- Formerly called multiple personality disorder
- Two or more distinct personalities exist in a single body. Both identity have influence on persons thoughts and behaviors
- The two identities are *distinct* from each other. Each has its own:
    - mannerisms,
    - emotional responses,
    - distinct "physical changes" -not actually different physical differences but one identity could identify as right handed and another as left handed
    - Denial – denying the existence of the other identity. Not aware of other distinct personalities exist within that person.
- Who have this disorder? People typically have a history of child abuse or other extreme life stressor.
    - Perhaps develops under cases of extreme stress, which leads to a person's conscious awareness dissociating/separating from painful memories, thoughts or feelings.
- How common is this disorder? It is extremely *rare.*
    - Only popularized by news (usually fake/extreme cases) and movies
    - Hillside strangler was a fake case, a person who claimed that his crimes was because of this disorder
- Controversy surrounds DID due to its rarity. For the following reasons:
    - Rare in North America, but even more rare in other parts of the world. Some experts think it's a social construct more than a disorder.
    - Can the disorder be induced by therapists? Leading questions by therapists.

        - Individuals of therapy might play along with the leading questions of the therapist or lie.
    - We all to an extent role-play. We all play different roles in many different circumstances (we are a son, and father, and boss at the same time). So we all to a degree have DID. In extreme stress, you might lose yourself in these roles, much like an actor can lose himself while playing a part.

Somatic Symptom Disorders and Other Disorders

- Medical conditions typically result in physical symptoms.
    - Medical conditions can also result in psychological symptoms. In the case of autoimmune conditions, cardiovascular disease, and diabetes. People with these conditions can have symptoms of depression, anxiety (like mental disorders)
- Mental disorders (disorders effecting the mind such as depression, schizophrenia, anxiety disorders) can result in psychological conditions.
    - Mental disorders can also manifest into physical conditions. Ex. Depression can manifest in disturbances of sleep.
    - In some mental disorders, the manifestations of physical symptoms can become a big deal. Mental disorders can exacerbate existing physical conditions or can directly lead to their own physical symptoms. **These are called somatic symptom disorders.**
- **Somatic Symptom Disorder:** mental disorders manifesting in physical (somatic) symptoms.
    - *Can be any symptom.* Wrist pain or general feeling of fatigue
    - *May or may not be able to explain what we see* (the physical condition). May or may not be related to a physical condition
    - Must cause *functional impairments.* Stops them from going to school or enjoying life. These individuals have excessive levels of all of the following symptoms: *worried* (excessively), have extreme levels of *anxiety*, and spend lots of time and energy worrying/stressing about these symptoms, etc.
- **Conversion Disorder**
    - Must look like *Neurological symptoms only* – like problems with speech, swallowing, seizures, paralysis
    - Neurological symptoms that we see are incompatible with any known neurological or mental condition. *We cannot explain these symptoms* based on test or clinical exam.
    - Sometimes have a level of psychological stress or traumatic event resulting in manifestation of neurological symptoms
    - The DSM-5 criteria for conversion disorder states the individual Must exhibit at least one symptom of altered voluntary motor or sensory function that shows internal inconsistency, causes distress or impairment, and cannot be explained by another mental or medical disorder. The ICD-10-CM categorizes by symptom

type, with weakness (or paralysis) and abnormal movement (tremor) listed as specific symptom types.

- **Factitious Disorder**
  - Patients want to be sick. The patient will falsify or disease their signs or symptoms to get a diagnosis/treatment. Ex. They might injure themselves, falsify tests. This is often called Munchausen's syndrome.
  - Munchausen's by proxy -when one person makes another person look ill so medical attention/treatment provided further for another individual.
  - People do this to be in sick roll (not for money)

Personality Disorders

- Personality is how we experience the world (our inner experience) and how we behave outwardly.
- **Personality disorder:** marked deviation from how we expect the people to behave or how the person is experiencing the world. This difference leads to distress/functioning.
- **This category is controversial.**
- There are 10 personality disorders which are split up into three clusters. Cluster A (odd and eccentric traits), Cluster B (dramatic, emotional, erratic traits), and Cluster C (anxiety and fearful). There is an overlap between the clusters. One person might have one or more types of personality disorders out of the 10 that there are.
- How to memorize: A= 3, B=4, C=3. A= weird, B = wild, C = worried. A= PSS acronym, B/C = ABHNADO – gibberish words that work for me)
- Cluster A has three personality disorders: (Acronym: PSS: **P**sych &**S**ociology **S**ection)
  - **Paranoid**: profound distrust + suspicion of other people. [paranoid of others]
  - **Schizoid**: emotionally detached in relationships and shows little emotion. (what people sometimes incorrectly consider as antisocial) [DISTANT, can spell as DiZtant. D and Z in schizoid and D and Z in distant]
  - **Schizotypal**: odd beliefs/ magical thinking (t in typical = think of magical hat)
- Cluster B has four personality disorders: (Acronym including B and C clusters: ABHNADO)
  - **Antisocial**: little or no regard for others. Commit crimes and show no remorse. Inconsiderate of others. [Self-explanatory. Hates/ANTI society]
  - **Borderline**: Unstable relationships, emotions are unstable, variable self-image and compulsive (which can put them in danger). People at the borderline are at the brink of an emotional/relationship issue. Ex. Displays characteristics of a stereotypical teenager. [acronym: 13 year old Borderline Brenda]
  - **Histrionic**: Are very attention seeking. Display emotions outwardly, wear bright clothes. Ex. [H for Hollywood Actresses]
  - **Narcissistic**: huge egos, need for admiration and praise, grandiose. ex. Dr. House (in TV show House…House is a show that is on **N**etflix), Hitler, his documentary is also on **N**etflix
- Cluster C has three personality disorders (ADO)

- **Avoidant**: inhibited, feel inadequate and try to *avoid* putting themselves in a situation where they can be criticized. [self-explanatory]
- **Dependent**: submissive and clingy. Ex. Those who stay in physically abusive relationships, [imagine: Dependent Debby clings and is submissive to her husband Dan)
- **Obsessive-Compulsive <u>Personality</u> Disorders** (OCPD). (do not mix with OCD). Very focused on life being ordered and things being perfect and for them being in control to an extent where it annoys other people. It is a personality! On the other hand, in OCD the focus is on order, things in control, having to wash hands.

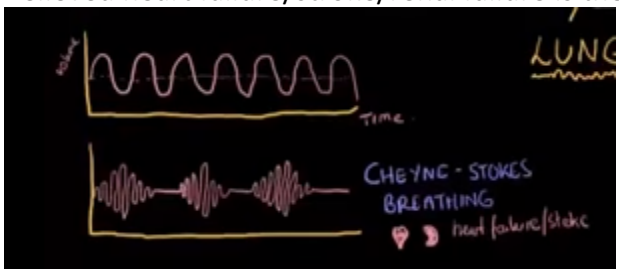
- Large degree of controversy of Personality disorders.

xSleep Disorders

See above notes

Sleep Wake Disorders Breathing Related Sleep Disorders / Breathing Related Sleep Disorders

- Sleep problems occur in three areas: brain, upper airways, or lung/chest walls
  - Brain - which regulates respiratory center of the lung
    - **Central Sleep Apnea**- central (brain is part of CNS)), sleep (at night), apnea (effects airflow).
      - Looking for apnea without obstructions. Looking at 5+ apneas/hour during sleep.
      - Problem with the brains control system for ventilation (that control brain for breathing)
      - **Cheynes-Stroke breathing** – crescendo then decrescendo breathing followed by stop in breathing. Normal breathing pattern is inhale/exhale changes from a normal fixed pattern.
      - Believed heart failure/stroke/renal failure is the cause.



  - Upper Airways- obstruction from mouth to the lungs
    - **Obstructive Sleep Apnea** – when airways are obstructed. Soft tissues around our neck can relax at night and potentially cause obstruction of airflow for a short period of time. Gets worse as people get older.
      - At nighttime, this causes snoring or gasping or pauses in breathing.
      - At daytime, people are tired/sleepy and unrefreshed

        - Diagnosed by: Sleep study (a polysomnography) and looking for 15+ “apneas”/hour (Apnea – lack of airflow).
    - Lungs or chest walls – stops lungs from being able to expand
        - **Hypoventilation Disorder** – When we are not able to ventilate our lungs fully and remove all CO2. Results in a buildup of CO2, and a decrease in O2. Can occur due to medications that repress respiratory functions (narcotic pain killers such as opioids) or if there is a problem with the lungs or chest wall. A common occurrence is due to obesity.
            - High CO2 can cause right sided heart failure
            - Low O2 effects all organs/tissues of bodies. Cognitive impairment, heart problems (arrhythmias - abnormal heart rhythms), and polycythemia (elevated RBC in blood)

xReward Pathway in the Brain

See above notes

xDrug Dependence and Homeostasis

See above notes

xTolerance and Withdrawal

See above notes

xSubstance Use Disorder

See above notes

Biological Basis of Alzheimer’s disease

- Most common disorder in dementia category, or neurocognitive disorders. Loss of cognitive functions. Memory also decreases. But normal motor functions are fine until later stages where they lose basic **activities of daily living (ADL)** – toileting, eating, bathing, etc.
- Cause of disease is limited.
- Brain tissue has decreased in size significantly – shrivelled up, **atrophy**.
    - It’s the **cerebrum** that often dramatically decreases in size. Severity of atrophy correlates with severity of dementia.
    - Starts in temporal lobes, important for memory.
    - Later, atrophy spreads to parietal and frontal lobes. Many other cognitive functions.
- Under microscope, 3 main abnormalities: **loss of neurons**, **plaques** (amyloid, because plaques are made of beta-amyloid. Occur in spaces between cells, outside of neurons in abnormal clumps), and **tangles** (neurofibrillary tangles, clumps of a protein **tau**. Located

inside neurons. Develop proteins normally in the brain, but changed so it's abnormal and causes them to clump together).
    - Not clear if they're what's killing neurons, or if they're a by-product.
- Group of neurons at base of cerebrum, called the **nucleus basalis** is often lost early in course of Alzheimer's. Important for cognitive functions – send long axons to cerebral cortex and through cerebrum, and release **acetylcholine**. Contribute to cognitive functions of disease.
- Synapses appear to not function clearly long before disease.
- Also **genetic mutations**, many involved in processing of amyloid protein.
- Also **ApoE4** involved in metabolism of fats is strongly related to AD.
- Also, **high blood pressure** increases risk of disorder too.
- Things that decrease it – higher education, challenging jobs with difficult thinking.

Biological Basis of Parkinson's Disease

- Progressive neurological disorder involving motor abnormalities and mental dysfunction (neural) too. Most common neurological problems are slowed movements, a type of tremor, increased muscle tone, abnormal walking, and poor balance (leading to falls). Muscles are stiffer and slow with tremor. Later in disease when motor abnormalities are severe, patients may not be able to care for themselves and have abnormalities of cognitive, emotional, and autonomic functions.
- Brains of patients have abnormalities visible to naked eye – in brainstem, the **substantia nigra** (means black substance, usually darker than surrounding black tissue in normal patients) is less dark or not dark at all in Parkinson's disease patients. Suggests only one type of neuron is involved. These cells/neurons lost are **ONLY dopaminergic neurons** (NT dopamine releasing). Motor abnormalities related to loss of dopaminergic neurons lost at the substantia nigra.
    - Dopaminergic neurons in other areas are lost as well.
    - Substantia nigra is one part of the **basal ganglia.** If we section a brain from top to bottom, and we look at deep area of cerebrum, near the center there will be a collection of structures called the basal ganglia. One part of this is the substantia nigra. Basal ganglia is located at the base of the forebrain.
        - Basal ganglia plays a role in motor functions and some mental functions. Receives info from many places in nervous system, particularly the outermost layer of the cerebrum (cerebral cortex).
        - Basal ganglia processes that info and sends it back to areas of cerebral cortex to influence areas of activity such as motor cortex.
    - Substantia Nigra also projects to area of basal ganglia called the **striatum**, and loss of Dopamine neurons protecting from substantia nigra to the striatum causes most of motor abnormalities of Parkinson's.
    - Under the microscope, we see "diseases neurons" which are degenerating in the substantia nigra. Often contains **Lewy** bodies - abnormal structures inside Dopaminergic neurons of Substantia Nigra. The Lewy bodies contain a protein

alpha synuclein, a normal protein present in brain cells under normal conditions are clumped together in Parkinson's disease.
        - Area of research: Do Lewy bodies kill the dopaminergic neurons? Or is something else killing these dopaminergic neurons and the Lewy bodies are formed in the process?
    - In more-advanced stages of Parkinson's Disease - there are wide spread neuronal loss and Lewy body depositions throughout cerebral cortex. This disease also includes cognitive dysfunction.
    - **Lewy body disease** - less motor abnormalities from basal ganglia dysfunction and more cognitive dysfunction from loss of function from cerebral cortex. Separate from Parkinson's.
- Risk factors: genetic mutations have been found in some families with inherited form of disease, rural living with exposure to agricultural chemicals can be a risk factor.
    - unclear how these factors cause or contribute to the disorder.
- Leading candidate for treatment with stem cells since only 1 type of cell affected.

Depression and Major Depressive Disorder

- **Depression/Major Depressive Disorder** - characterized by prolonged feeling of helplessness and discouragement about the future. Individuals with this disorder have the following:
    - Has physical and emotional component. **Sadness + SIG: E CAPS**: (Acronym)
        - **S**uicidal thoughts: low self-esteem, low mood
        - **I**nterests decreased: lack of interest (anhedonia)
        - **G**uilt:
        - **E**nergy decreased – lethargy (feeling fatigued)
        - **C**oncentration decreased – trouble making decisions
        - **A**ppetite disturbance (increased or decreased)
        - **P**sychomotor changes/symptoms (agitation or retardation)
        - **S**leep disturbances (increased or decreased)
        - + Weight gain or loss.
    - #1 reason people reach out for mental health services –
        - "common cold". Good term because it captures the pervasiveness of disorder. 13% of men, 22% of women meet criteria for depression at least once in their life. 31% of college students might experience this disorder. Not a good term because it implies depression isn't that bad, which it is.
    - Can be triggered by a life event (loss/break up) but doesn't have to me.
    - Common for people to have anxiety disorders with it.
    - Three factors: Biological, psychological, sociocultural/environmental factors. All three play a role. Called the **BioPyschoSocial model of depression**
        - Biological factors –
            - genetic component (from family/twin studies)

        - Depression is super complicated though: 5-HTTLPR Gene associated with depression, but ONLY if individual is in a stressful environment. If someone is in a low stress environment, they have a decreased risk for depression.
    - Decreased activation in prefrontal cortex (associated with difficult in generating actions and decreased decision making capacity)
    - Lower levels of activity in reward circuit in the brain.
    - Associated with NT – fewer receptors for serotonin (monoamine) and NE (monoamine/catecholamine).
- Psychological factors –In depression the following occur:
    - Behavioral theory - **"learned helplessness"** – begin to feel powerless if they have no control over the environment they are in repeatedly. "uncontrollable exposure to an aversive stimulus "independent to intensity of punishment
    - "Cognitive theory" – **cognitive distortions** - getting trapped in negative thought pattern. When you continue to think about negative thoughts.
    - Cognitive theory – **attribution**. These form a pessimistic /negative attributional style which makes people vulnerable to depression
        - Individuals with depression link negative experiences to *internal causes*. They think negative experiences will continue to occur in the *future*. They also think negative experiences are *global*
            - Ex: a friend doesn't call you back, you start thinking it is because you are unlikeable, you start thinking this will happen in the future and also that another friend doesn't like you.
        - Are pessimistic attribution style individuals more likely to have depression or is it the other way around. Not always clear.
    - Coping style and self-esteem might have to do with depression. Do these cause depression or are they a result?
- Sociocultural/Environment factors
    - **Co-rumination/Empathy**: having a friend/roommate/partner with depression can increase likelihood of individuals around you getting depression. Might be due to people talking about problems and the negatives of them instead of how to solve them. You also take on the (empathize) with the emotions of those close to you. This empathy might cause depression.
    - **Low Socioeconomic status** or those who lost a job/struggling to keep a job have a higher risk of developing depression
    - Social isolation/child abuse

        - Internalization of prejudice = higher likelihood of depression
            - Ex. You grow up in a household that has negative attitudes toward homosexuality and you start to like people of the same sex. This can lead to depression
    - **Dependent Stressor** - Depressed person would be expected to experience a greater number of stressful events that he or she influences (i.e., dependent stressors).
    - An **independent stressor** (i.e., the death of a loved one) occurs without the person's influence. Equal amounts.

Depression and Bipolar Disorder

- Bipolar disorder is very related to depression
- Bipolar disorder *used to be* referred to as "manic depressive disorder"
- Bipolar disorder – A condition where someone swings from *extreme emotional highs to extreme emotional lows.*
- Individual with bipolar disorder will have periods of depression and periods of mania
- Mania is a state of high optimism, high energy, high self-esteem, euphoria, poor judgement, poor decision making (which can cause financial distress), risky behaviors (ex. Driving to quick, or risky sexual behavior), delusions of grandeur (unrealistic thoughts), heart races, people don't sleep, racing thoughts. Followed by a crash (a depressive episode).
    - Mania acronym: **DIG FAST** (**D**istractibility, **I**nsomnia, **G**randiose, **F**leeting thoughts, **A**gitation, **S**peech (pressured), **T**houghtlessness (risky behavior)
- ***Hypomania*** – *mild forms of mania* **i**s sometimes not that bad. Lots of energy and don't need to sleep a lot so you get lots of work done. You also feel good. Creativity. Results in mania at times, but sometimes does not develop into a mania.
- A hypomanic episode is a period of abnormally elevated mood and abnormally increased energy lasting at least 4 consecutive days; however, the episode is not severe enough to cause impairment in functioning or to require hospitalization.
- A manic episode is a period of abnormally elevated mood and abnormally increased energy lasting at least 7 consecutive days; however, the episode is severe enough to cause impairment in functioning or to require hospitalization
- **Bipolar I disorder** – when hypomania becomes manic w/ or w/o major depressive disorder
    - **An individual diagnosed with bipolar II has never had a manic episode.**
    - Although it is possible for an individual diagnosed with bipolar I to never experience hypomania, it is extremely unlikely.
- **Bipolar II disorder** – when it remains hypomania + one major depressive episode
- **Cyclothymic disorder** – hypomania + dysthymia

Social Psychology

Conformity and Groupthink

- **Social Psychology** – how individuals think, feel, and behave in social interactions
- People act differently in groups than individually
- **Conformity –** "peer pressure", tendency for people to bring behaviour in line with group norms. Powerful in social situations. We use social situations (especially ones with peers) to determine what is acceptable, when to question authorities, and get feedback on behavior.
    - This is why it is important for people to have positive peers. If group behavior is positive, then there will be peace, harmony, happiness
    - Negative peers = negative behaviors, which can be catastrophic
- When do people conform to group norms even when behaviours negative/wrong?
    - Ex: Imagine you are part of a group asked to train a dog. Group decides to train it with a shock color and you agree. Why would you agree?
    - There are two reasons why you would agree/conform with the group:
    - 1) **Informative influence:** look to group for guidance when you don't know what to do and you assume the group is correct.
        - Ex: You have never interacted with a dog before and you are uncertain about how to train a dog and you are uncertain if it's an appropriate method to use a shock color. You look for the group for guidance and you assume they are correct.
    - 2) **Normative influence**: even if you know what's right, do what group's negative actions to to avoid social rejection.
        - Ex: you are an expert group trainer and you know it's easier to train the dog with treats than treat it with a shock color. Even though you know training the dog with a shock color is incorrect you may still decide to go along with the group to avoid being a social outcast. You fear social rejection that can come with disagreement with the group, so you conform to even a wrongful act.
- 2 different ways a person can conform **– publically** or **privately**.
    - If you **privately conform**- change behaviours and opinions to align with group.
        - Ex: If you privately conformed to the shock color, you would leave the situation with a genuine belief that the best way to train a dog is with a shock color.
    - If **publically conform -** you're outwardly changing but inside you maintain core beliefs. You only outwardly agree with the group.
        - Ex: you agree to the shock color in the group situation but you also know that the treats is a more effective route. You are not convinced. When you are alone you train the dog with a treat.

- Problem Solving/Decision-making often takes place in groups. Factors that influences an individual's problem solving/decision making – the group interactions shape the outcome.
    - **Group polarization is** a phenomenon where group decision-making amplifies the original opinion of group members. A stronger version of the decision is adopted.
        - For a view point to influence a groups final decision making:
            - All the view do not have equal influence.
            - Viewpoint is shared by majority of members of the group
            - Arguments made tend to favour popular/majority group view
            - Any criticism is directed towards minority view
            - **Confirmation bias**: group members seek out information that support the majority view.
            - **Ex**: majority of the group agrees that training the dog with treats is the best way to go about it. Some people chastise those who say the collar is the best way to train the dog. The individuals leave the discussion that training the dog with treats is amplified
- **Groupthink** – occurs when maintaining harmony among group members is more important than carefully analyzing problem at hand. Happens in very cohesive, insulated groups. Often have important/respected leaders, and in the interest of group "**unity"** individuals suppress/sensor their own opinions.
    - First suggestion proposed by the leader is adopted. Especially if there is little hope of finding a better solution. Not the most effective way to make a decision and can explain what's wrong with Congress in the US.
    - Ex: neighborhood people decide to meet to discuss a dog exhibiting bad behavior. Leader says the dog should be put down to avoid damage to the neighborhood. Instead of arguing with the leader and having a conflict, the neighbors agree that the dog should be put down.
    - To avoid group think: bring in outsiders/experts, have the leader of the group not disclose opinion, discuss what should be done in smaller groups
- Recap: Conformity, Group Polarization and Group think are all processes when individuals come together in a group. Can be positive if the group is open minded, positive, and willing to consider more than one opinion.

Conformity and Obedience

- Conformity and obedience refer to different, but related things.
- **Conformity** – "peer pressure" – how we adjust our behaviour/thinking (cognition) to match group.
    - Can be positive. Ex: If you see a bunch of people running out of a building, that you are just about to enter, you would probably conform to this behavior and run away as well

    - Can lead to negative behavior. Ex. In teenagers peer pressure can lead to negative behaviors. “If your friend jumped of a bridge, would you too”
- **Obedience** – describes how we follow orders/obey authority. No cognitive component. Ex. “I’m just following orders”
    - Can be positive. Ex: Firefighter tells you to not enter a building because it’s on fire – you would probably acknowledge authority and obey.
    - Can be negative: ex. normal people committed such negative acts during the Holocaust due to obedience.
- Both conformity and obedience can be positive (useful/helpful/important aspects) or negative in their effects on social behavior in society.
- We can conform/obey in little ways as well:
    - Ex: we obey traffic laws or agree that cereal is a breakfast food. We don’t question if we should stop at a stop sign.
- **Social Anomie –** breakdown of social bonds between an individual and community. A situation in which society does not have the support of a firm collective consciousness. Social anomie can also result in social groups disbanding, and alienation from social groups. **To resolve social anomie, social norms must be strengthened and groups must redevelop sets of shared norms.** Can lead to uncertainty in social situations. Means that there is a weakened sense of morality and criteria for behavior.
    - “Associated with functionalist theoretical paradigm in sociology. The concept of anomie describes the alienation that individuals feel when social norms and social bonds are weak. Without attachment to society, people will experience purposelessness, and aimlessness. Periods of rapid social change are often associated with anomie.”
- # of types of conformity and obedience: compliance, identification, and internalization
    - **Compliance** –situations where we do behaviour to get a reward or avoid punishment. Tendency to go along with behaviour without questioning why. Compliance goes away once rewards/punishments removed.
        - "Compliance refers to a change in behavior that is *requested* by another person or group; the individual acted in some way because others asked him or her to do so (but it was possible to refuse or decline.)
            - Compliance is the tendency to agree to do what is requested especially if there are certain factors present: a feeling that there is give and take, believability, likability, limited supply and positive feedback from others. Robert Cialdini studied how successful marketing results in consumer compliance. For example, soft drink labels have long used celebrities to increase compliance. The ordinary consumer would buy the drink because they liked the celebrity, assumed that the celebrity approved of the product, and believed what he had to say about it.

        - Ex. paying taxes (I will get punished if I don't pay my taxes). TSA screenings (nobody likes them, but you won't be allowed on the plane if you don't)
    - **Identification** – when people act/dress a certain way to be like someone they respect. Will do this as long as they maintain respect for that individual.
        - According to Freud, as children develop, there comes a time in which the child must adopt the characteristics of one of the parents. During this process of identification, the child adopts the characteristics of the same-sex parent and begins to associate themselves with and copy the behavior of significant others. In addition, Freud stated that this process also involves the development of the child's superego (our moral guide in life - the moral component of personality) which is done by incorporating characteristics of the parents' superegos into the child's own. So, a young male child will begin to take on characteristics of the father (act more like his father than his mother in the sense of being a male) and will develop a superego that has similarities to the moral values and guidelines by which the parents live their lives (e.g., if the parents are honest people, the child may come to realize that honesty is important and that lying is wrong).
        - Ex: football player people admired and bought his jersey, but then he engaged in domestic violence and once it was made public the identification of this player by people dropped significantly.
    - **Internalization** – idea/belief/behaviour has been integrated into our own values. We conform to the belief privately. Stronger than other types of conformity.
        - Internalization refers to the normal process where children learn and absorb (internalize) knowledge and rules about the world from social context, rather than through being specifically told. This is how children learn how to alter their behavior in response to the situation that they are in (home, school, church, playground, etc.)
        - Ex: start going to gym to comply with friends, but then might internalize that exercise is good for you and continue the behavior
- Can conform due to different types of social influence- pressure we feel from those around us
    - **Normative Social Influence -** If we do something to gain respect/support of peers, we're complying with social norms. Because of this we might go with group outwardly, but internally believe something differently.
        - Ex: friends are all obsessed with a certain singer. You tell the group you like the singer as well even if you absolutely hate him/her. You continue to say you like it (or even go to the singers concert)
    - **Informational Social Influence** – when we conform because we feel others are more knowledgeable than us, because we think they know something we don't.

        - Ex: when you move to a new place. You would ask people around you (who lived in this place for a longer period) of things to do /places to eat and go along with their suggestions.

Asch Conformity Studies (Asch Line Studies)

- One of most famous conformity experiments.
- **Solomon Asch** (1907) was part of the group known as **Gestalt Psychologists** – believed not possible to understand human behaviour by breaking down into parts, people must be understood as whole.
    - "Most social acts have to be understood in their setting, and lose meaning if isolated. No error in thinking about social facts is more serious than the failure to see their place and function." ~Solomon Ash.
- Holocaust influenced Ash's studies of conformity (was born in Poland and moved to US at age of 13). Was interested in studying how group behavior can influence behavior of an individual. What aspects of the group behavior is most important.
- Ex. Participant in study, many other participants too. The experiment explains a boring experiment to you – he holds up a card with a target line and 3 comparison lines, and the participants need to figure out which comparison line matches target line. This occurs 18 times (12 trials where the confederates give wrong answer, 6 where they give correct answer).
    - First trial, each participant everyone gives what is obviously right answer. Second trial, same occurrence. Error rate <1%
    - Third trial, answer remains just as obvious, but the first participant gives the wrong answer. The second group member than gives the same wrong answer. The study found: 75% of participants give the wrong answer (conform to the wrong answer) at least once and 37% conform every single time the group does.
        - People often say they would always give right answer even when majority is giving incorrect one.
    - In this experiment, the other participants of the group were **confederates** (actors, told what to do) and were told what to do by the experimenter. The purpose was to determine if the real test participant would go along with the other group confederates incorrect decision.
    - No actual pressure to conform, i.e. no prize for conforming to the study and no punish for not conforming. Only perceived pressure to conform
- **Why did the individuals conform?** After study they were asked why they conformed.
    - **Example of Normative social influence**: Most participants said the answer they gave was incorrect but went along with it because they would otherwise feel ridiculed by the group. Altering behavior to of those around us. The people knew the correct answer, but went along with wrong answer regardless.
    - Example of **Informational Social Influence:** Some study participants conformed because they doubted their own response. They reasoned that because all of the participants at the table were giving a certain answer that it must be correct.

Change our behavior because others are better informed. Saw what they thought was the correct answer but then after hearing responses of the group, they changed their minds and thought they were wrong. They gave the same answer as the group – deferred to their judgement.
    - Finally, some participants made a **perceptual error** – truly believed answer given by others were correct. They were never consciously aware of any dissonance of the judgements.
- **Why did some of the participants not conform?** After study non-conforming individuals were asked why they did not conform
    - Some were really confident, really sure their answers were correct and others were wrong
    - Others were not confident but stuck with their answers
- Criticisms/Problems with study:
    - All participants came from the same **population** (all male undergrads from same culture) – women, individuals from minority groups, individuals from different cultures or age ranges might have reacted differently
    - Participants knew they were coming in for a study. **Participant** were **suspicions** of the study. Perhaps individuals would conform once just to see what would happen.
    - **Ecological validity –** do the conditions of the study mimic those of the real world. If they don't, we can only make limited conclusions. A line in lab (in this experiment) is not same as conformity in the real world.
    - **Demand characteristics** – describes how participants change behaviour to match expectations of experimenter. Conformed because that's what experimenter wanted them to do.
- Still, 75% of individuals confirmed with no pressure. How much more powerful would experiment be with a pressure/reward/punishment or if your friends/professors/teachers were the confederates (rather than random college students).

Events That Inspired the Milgram Studies on Obedience

- One of most famous studies on conformity/obedience are Milgram studies
- Studies began in 1961, important because often studies are conducted in response to something. In this case, in response to the Holocaust. Milgram's parents had emigrated from Europe and were Jewish. Milgram was born in the US but deeply affected by the Holocaust.
    - "I should have been born into a German speaking Jewish community of Prague and died in a gas chamber some 20 years later. How I came to be born in a Bronx hospital, I'll never understand" ~ Milgram.
- Milgram was effected by trials of Nazi leader after WWII. Nazi Leader Eichmann was a Nazi Officer who escaped to South American (and was not tried in Noremberg Trials post WWII). He was captured, brought to trial, then death by Nazi-Hunters in 1960, right

before Milgrim conducted his study. Eichmann was a normal guy (ordinary, normal personality) who wasn't guilty after caught. He didn't have an intense hatred like other Nazi leaders. This was surprising because Eichmann had deported Jews to death camps. Eichmann acknowledge he was the one who did this, and didn't feel guilty of the consequences.
    - "The world now understands the concept of desk murder. We know that one doesn't need to be fanatical, sadistic, or mentally ill to murder millions; that it is enough to be a loyal follower, eager to do ones duty" ~ Simon (the person who captured Eggman)
- Many Nazi Officers/German followers/Eichmann said they were "just following orders". Everyday people can commit horrendous acts if put into certain situations.
- Milgram wanted to know if everyday people can be made to follow orders like the Nazi officers.
- Can a normal person be made to harm an innocent individual just because of an authority figure? It isn't as simple as "they are evil" "we are good"

Milgram Experiment on Obedience

- Milgram studies were done to study the willingness of participants, average Americans, to obey authority figures that instructed them to perform behaviors that conflicted with their personal beliefs and morals.
- Deceived study participants in order to recruit participants. Posted ads about recruiting people to a study on memory/learning. The purpose was to get everyday people.
- When participants arrived at lab, participants were told the study they were participating in was going to be looking at effects of punishment on memory/learning (Do people learn best after being punished for making a mistake).
    - In the study there was the experimenter, one confederate (in on the study) participant, and another participant (real participant). Between the two experiments, they "randomly" decided who was going to be the learner and who was going to be the teacher. Not so random, the confederate always got learner role, and real experiment got the teacher role.
    - Learner (confidante experiment) was hooked to a # of electrodes, and told that the teacher will teach the learner a # of word pairs. Then the learner would be shocked whenever they gave the wrong answer.
        - In some versions: the learner noted that they were worried about the experiment because of a heart condition. The experimenter told them not to worry - that the shocks would be painful but not dangerous.
        - Teacher (real participant) was taken to different room without visual contact with learner, and sat in front of shock box. Shock box had switches that would shock the experimenter at 15V, and then switches increased in increments up until 450V. Switches also labeled from slight shock, moderate shock, strong shock, very strong shock, intense shock, danger.

        - Teacher than instructed to read a list of word pairs. Then were told to read first word of each pair and then offer four possible pair words. Leaner would indicate their answer by pressing a button which was displayed to the teacher.
        - Whenever the learner made error, teacher was instructed to give shocks with increasing increments with each wrong answer (no actual shocks were given even though the teacher thought so).
        - After giving some correct answers, the learner started giving incorrect answers (which were determined by the experimented beforehand).
        - At the first coupe shocks, the learner would not elicit much of a reaction. After several increasing shocks, learner would cry out in pain/pound out on wall. Also after some shocks would start complaining about their heart condition. As shocks increased, continued to yell/scream they want to quit.
        - Finally, all responses from learner would cease and only silence.
    - Teacher instructed to continue by experimenter when teacher looked @ experimenter for guidance. Experimenter told teacher: "please continue (please go on)", "the experiment requires that you continue, "it is absolutely essential you continue", "you have no choice, you must go on".
    - Experiment stopped when teacher had 4 verbal protests about the study or when they gave the 450V shock three times.
    - Before experiment, Milgram asked professors/clinical psychologists if the teacher would obey the commands of the experimenter. They said that most teachers would stop once the learner protested and that very very few people would shock all the way. Those that did, were probably psychopaths.
- When results of study came out, the results were very disturbing – 65% of participants shocked all the way. The teachers had protested and were trembling, but still obeyed commander and shocked to 450V. In versions of experiment where the learner claimed to have a heart conditions and complained that the shocks were hurting their heart – compliance dropped very little – to 63%. Everyday Americans heard the cries of people they were tormenting and continued with the task. **VERY FEW PEOPLE RESISTED AUTHORITY.**
    - "I set up a simple experiment at Yale University to test how much pain an ordinary citizen would inflict on another person simply because he was ordered to by an experimental scientist. Stark authority was pitted against the subjects' strongest moral imperatives against hurting others, and, with the subjects' ears ringing with the screams of the victims, authority won more often than not. The extreme willingness of adults to go to almost any lengths on the command of an authority constitutes the chief finding of the study and the fact most urgently demanding explanation: ordinary people, simply doing their jobs, and without any particular hostility on their part, can become agents in a terrible destructive process. Moreover, even when the destructive effects of their work become patently clear, and they are asked to carry out actions incompatible with

fundamental standards of morality, relatively few people have the resources needed to resist authority." ~ Milgram

What Can We Learn from Milgram Experiment?

- One of most famous psychological study
- Regular everyday people will comply with an authority figure even if it goes against their moral values and harming others.
- Study has been **replicated**, and results remain same, no matter what country/time period/location. Full compliance always hovered at 61-66%
- Study was perceived to be unethical today and at the time too in the 1960s.
    - Milgram was denied tenure at Harvard and kept from entering lots of academic institutions because of the negative perceptions associated with the experiment.
- Things we should avoid:
    - Many participants really felt ashamed about what they had done, but even ashamed participants tended to speak poorly of the victims – he wouldn't have been shocked if he answered correctly/was smarter, the "**just world phenomenon" –** idea that universe is fair so people must get what they deserve - belief good things happen to good people, and vice versa (bad things happen to bad people). Some people use this to justify their actions. Assuming things had gone bad to the victim because he was deficient.
    - Also, many participants were comforted by **passing responsibility of actions to others** (when experimenter said they'd take full responsibility and participant would not be responsible for the harm, participants felt more comfortable). *"I was just following orders".* (seen in other cases of atrocities)
    - Is there a way we can stop this from happening, stop us from obeying authority in these controversial situations?
        - Be aware of the just world phenomena- and try to stop ourselves from making judgements about people for being in the situations they are in. For example: Stop thinking that people are poor because they didn't do well in school, didn't work hard enough, and didn't care enough. *Stop believing in the just world phenomena.*
        - Remind ourselves to take responsibility for our own actions. Avoid placing blame on others. *Stop the passing-responsibility to others*
        - Also, caution ourselves against **self-serving bias** – that we could never commit acts like this, because apparently, in the right situations most of us would.
    - **Fundamental attribution error** – focuses only on actions of others, tendency to believe that others in out-groups behave a certain way based on inherent personalities/flaws. Idea of attributing character too strongly to explain another group's actions. Real takeaway of study – how easy it is to think others are atrocious and evil, while people like us would only perform evil acts because

they're misguided. Truth is we're all misguided, all susceptible to authorities in ways that many of us would find upsetting.

- Important to have compassion for all people – victims and aggressor, don't know how you'd act in their place.
- Conversely, be skeptical if you hear "I was doing my job/just following orders" and try not to fall into this trap yourself.

Zimbardo Prison Study – the Stanford Prison Experiment

- **Zimbardo Prison Study – the Stanford Prison Experiment** - Final of three studies on conformity/obedience
- Study was conducted in 1971
- Purpose: how conformity/obedience can result in acts different from usual (on their own) or even contrary to how they think they would act. The answer is complicated (not only bad people do bad things). In certain situations can make otherwise ordinary people behave in strange ways.
- Goal: How social norms/conventions can influence behaviours of participants playing the roles of prisoners/guards.
- Prisoners/guards get so caught up in roles that they had to stop experiment early.
- Participants knew all about the study – no physical or psychological deception. And participants were normal (male, middle class, university students, with no medical/psychological problems).
- 18 students randomly assigned to be guards or prisoners. All knew the assignment was random.
- Had participants in prisoners arrested at unexpected times on a random day. Prisoners were treated as prisoners from the start and the prison had no windows and clocks so it became an environment different from outside world. The prisoners were fingerprinted, handcuffed, and numbered after arrest.
- Also met with guards and told them they were not supposed to physically harm prisoners, but could create fear/loss of privacy/loss of control/loss of individuality. Given uniforms, batons, and sunglasses. Instructed to refer to prisoners by #s and not names. Guards can do anything to maintain except for physically harm the participants.
- Day 1 uneventful. Then prisoners began to rebel against guards. Guards had to decide what to do.
- Day 2: early prisoner rebellion against guards and some prisoner's remained in their cell. Guards fought back against prisoners actions because it was a danger to their authority. Prisoners cursed at guards. At some point, guards began to see actual participants as dangerous prisoners that needed to be controlled. Guards used fire extinguishers on them and forced them to strip down. Guards regained some control and rebelling prisoners were put in a closet/solitary confinement. Closet only big enough to stand but they couldn't lie down or sit.

    - After 36 hours prisoners began to break down – literally. One prisoner starts to mentally break down (depression and uncontrollable rage, screamed, cried, yelled). Not the only prisoner who had mental breakdown, he was just the first.
- Day 3, situation went even further. Participants went on hunger strike. In response, guards forced the prisoners to repeat their #s over and over again, exercise (pushups till exhaustion), withheld bathroom privileges and other basic amenities, and tried to make the prisoners turn on each other and break them down.
- Day 4, continued escalations.
- Day 5, same.
- Day 6: Zimbardo had involved himself as prison warden. Zimbardo never realized things had gone wrong. His girlfriend, Maslach visited prison and so upset by what she saw she made him stop the experiment. His girlfriend is how Zimbardo was brought back to reality. Zimbardo then ends study
- By this time, half of prisoners already left from breakdowns. No guards had left.

Closer Look at the Stanford Prison Experiment

- Before experiment: all prisoners were similar, same background, college students, middle class, no physical or psychological conditions
- Prisoners did not band together usually, they were pretty distrustful of each other. The prisoners saw each other as informants.
- And guards didn't encourage solidarity, but tended to reward those they saw as good prisoners by giving privileges such as better foods, basic privileges, allowing them to keep mattresses etc. By giving privileges to some inmates and not others - guards broke solidarity of prisoners.
- Some released early due to emotional trauma. BUT, none of the prisoners just stopped and left the experiment, even though they were told at beginning of the experiment (in the consent form they signed) that they could. Why? Maybe it was a misunderstanding, they convinced each other to stay, or maybe didn't want to give up $ they were going to get for engaging in the experiment. These prisoners were just volunteered who could have left at any time.
- Why did the guards act so poorly towards the prisoners? The guards thought the prisoners were wimps, troublemakers, or faking distress. Many thought their behavior was not too extreme and placed blame of behavior on prisoners. None of the guards left the study and some were upset that the study ended early.
- The experiment shows us:
    - the influence situation can have on our behavior – might be due to **situational attribution** (due to situation), not **dispositional attribution** (internal characteristics/personalities of people)
    - It becomes much easier to behave badly towards individuals who suffer from **deindividualization** (loss of self) – In this case prisoners forced to dress same, and addressed as number.

    - Bad behavior caused **cognitive dissonance** – guards knowing their behavior was inappropriate, tried to reduce their mental distress by cognitive dissonance reduction - overly justified their behaviors – everything happened because prisoners were whims or they deserved it. They changed their cognition.
    - Also role of **internalization** – participants internalized their prison roles. Prisoners incorporated their roles into beliefs, and let it influence their attitudes/cognitions/behaviours.
- But many problems with the study:
    - Zimbardo himself played role of prison warden (to observe behaviors of input), but by doing so he compromised his objectivity (not a neutral observer). He was so involved that he passively allowed a lot of unethical behavior. Why didn't stop? He himself thought they were faking it to get released.
- Also, according to scientific methodology, this wasn't a good experiment. What were the operational definitions of dependent/independent variables? What was being manipulated, what was being measured, where were controls, etc.? Also small sample size? Different results if other people were involved? (Cant replicate so hard to know!) Also good example of **demand characteristics** (how much of behavior was influenced by how they thought experimenter wanted them to behave consciously or unconsciously).
    - Possible that all participants were acting the way that Zimbardo wanted them to act.
- Also could have been affected by **selection bias** – no deception in study, so what kind of student willingly signs up to be in prison for 2 weeks? So, was this really random sample?
- Overall: these criticisms don't discredit its results. The results of the study line up with other studies of conformity and obedience with stricter methodologies.

Factors that Influence Conformity and Obedience

- Are there factors that will make someone more likely to conform? Are there external factors that can cause someone to change how they think? External factors can cause someone to do things that have nothing to do with the person.
    - **Group size** – more likely to conform in groups of 3-5.
    - **Unanimity** – when opinions of group are unanimous (everyone agrees). In the Ash experiment, there was one supporter who answered correctly before the experimenter, and full-compliance of experimenter dropped from 37% to 5%. Individuals claimed that the response of the supporter influenced their response – they said they didn't. Shows that supporter shows reduced likelihood of conformity. We're not aware of effects a defector can have (someone who conform).
    - **Group status** – why children more likely to go along with popular group. Why we trust four doctors over four gardeners about our health.
    - **Group cohesion**- if we feel no connection with group, feel less of need to go along with that group.

- **Observed behaviour** – whether we believe our behaviour is observed. In Ash experiment, when the participant came in late, they said his response would be recorded on paper and not shared with the group. If response in Asch line was not shared with group, the experimenter was much less likely to conform.
- **Public response** – if we think we're met with acceptance vs. shunning. (happy to conform if we will be met with shunning, but will happily not conform if we think we will be met with acceptance)
- Internal factors **–**
  - **prior commitments** (if we say something earlier that goes against group, we will decrease conformity because we are less likely to say something different later. If we said something earlier that is along the lines of the group, we will have increased conformity because we will say the same thing now. We are not likely to change what we say).
  - **feelings of insecurity** – more likely to follow judgements of others (conformity)

- Likelihood someone will obey – following orders without question/protest. OBEDIENCE. In order to prevent negative consequences from disobeying.
  - Depends on type of authority giving orders.
  - Our **closeness** to authority giving orders- more likely to accept orders from someone we respect
  - **Physical proximity** – more likely to comply with someone we are close to. In Milgram when authority standing close by/behind the experimenter (the teacher) they are more likely to obey.
  - **Legitimacy** of authority – if wearing lab coat/carry a clipboard we are more likely to obey. Shown in Milgram study.
  - Also **institutional authority** – well-respected university. Expectation that these places won't give you a harmful command. Can also be physical or symbolic (ex. police/government).
  - **Victim distance** – in original Milgram study, teacher couldn't see learner (victim). If could see participant, reduced likelihood participant (teacher) would obey experimenter. But still didn't stop everyone (30% of participants gave all shocks)
  - **Depersonalization** – when leaner/victim is made to seem less human through stereotypes/prejudices, people are less likely to object against them
    - Depersonalization is a symptom of serious mental illness (although it can happen to anyone, repeated instances are suggestive of a dissociative disorder) in which a person feels like she has stepped outside of herself and is watching herself act, with no sense of control over her behavior.
  - **Role models for defiance** – more likely to disobey orders when we see others doing the same.
- No one type of **personality** makes someone more susceptible to authority. But people's **moods** can have an effect – those with rough day less likely to conform. Status and culture can play a role, those of low socioeconomic status (those with low power) are more likely to conform. Also cultures like US/Europe (individualized cultures) that

emphasize individual achievement less likely to conform than collective cultures (Asia, cultures that emphasize family/group).

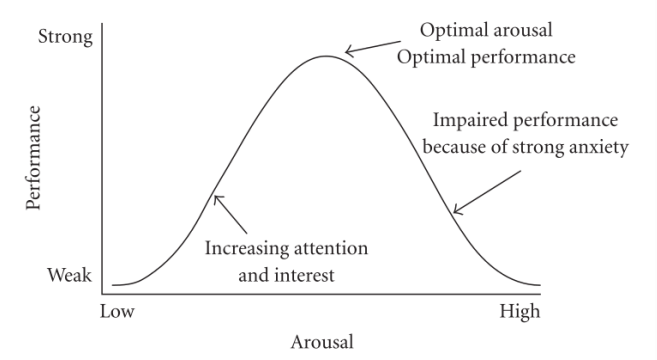
- People conform all the time like going to school or eating cereal for breakfast.
- These are reasons why ordinary people can do terrible things. But knowing these can reduce the negative outcomes. Just 1 non-conformer can make others not conform as well. Can understand social influence better knowing these factors.

Bystander Effect

- Person falls to ground nearby, would you help? People say yes, research says no. If in group, less likely to help. With increased group size, people feel less inclined to take action - called bystander effect.
    - **Bystander effect** Individual may feel less inclined to take action because of presence of others in the group. The bystander effect refers to a group process in which individuals observe an injustice or a crime being perpetuated and do not intervene.
    - Small group = less bystander effect. Large group = more bystander effect (leads to nothing happening by any one individual and people might not even call 911)
- Why? One may be lack of medical knowledge, or limited experience in assistance and think someone else would do it (one might assume that with such a large group of people, someone must have more experience than I have with unconscious person). This is called the diffusion of responsibility theory
    - **diffusion of responsibility theory** – explains bystander effect. When individuals are in presence of others where help is needed, feel less personal responsibility and less likely to take action when needed.
        - In a small group you don't diffuse the responsibility. You are more likely to feel personal responsibility to intervene. Ex. In a small group you might realize that you are only one who has practiced CPR.
- Amplified by amount of people in the group. If you were to collapse in small group, less chance of bystander effect. If only few people, more likely that people would be more inclined to take action and help you. Feel more personal responsibility.
- Bystander effect can lead to little happening by any individual. One example is story of **Kitty Genovese** – 28 year old women living in NYC who was stabbed, raped, and robbed while 38 people were in vicinity (witnesses). Horrific attack spanned over half an hour. Kitty was pleading for help and the victim later returned to kill her. 38 witnesses didn't take action because there were so many other people present in the vicinity.
- **Deindividuation** – those in group are more likely to act inappropriately because crowd conceals person's identity. Good example is behavior of some on Black Friday. Presence of large group there is violence (shoppers trample employees, shot shoppers, stolen goods from stores). Presence of large group decreases their inhibition/guilt, hence increases antisocial/deviant behavior. Another example is the internet – anonymous platform causes people to express opinions they typically would not express. (ex. Youtube comments people are nasty, cyber bullying)

Social Facilitation and Social Loafing

- **Social facilitation** – how would presence of others affect your behavior? Would it *Help or hinder* your performance? According to social facilitation, most **dominant response** for particular behavior would be shown. Dominant response refers to response most likely to occur. In the example of a presentation, if you practice inside and out, presence of others will lead you to perform well. If you haven't practiced well, presence of others will make you perform more poorly (exacerbate your mistakes). Social facilitation occurs when individuals perform better in front of an audience.
    - Occurs when an individual completes a manageable task in front of an audience. When an individual works on a challenging task in front of an audience, this might increase arousal beyond optimal and interferes with performance"
    - Presence of others increases your **arousal** – your general physiological or psychological excitement (Increased HR, faster breathing, activation of autonomic nervous system) and is known as *nervous energy*. Increased energy/arousal increases likelihood of dominant response occurring. Whether dominant response is correct or accurate depends on how easy the task is, and how well you've learned it/rehearsed it. Presence of others improves performance (helps) on **simple tasks**, and hinders it on **difficult tasks**/unpracticed tasks. (This is known as **Yerkes-Dodson Law**).
        - Increased arousal occurs only when person's efforts are evaluated. Ex: if you are giving a presentation to close friends who are not evaluating you, you may not have any nervous energy, because you feel comfortable around them



- **Social loafing** is a tendency to put forth less effort in group task if the individual contributions aren't evaluated. Social loafing is the tendency for individuals to put forth less effort when part of a group.
    - **Group-produced reduction of individual effort** – groups experiencing social loafing are less productive, put forth less effort, and perform poorly. Perhaps to guard against being the person who is doing all the work, or because you know that your individual contributions are not evaluated.

        - Ex: in group project of a presentation, they put in less effort and perform poorly.
    - Can be reduced by making task more difficult, or separating performance of individual in the group (giving own person their own grade), or make individual components to each group member
- So does presence of others help or hinder performance? Depends.
- The **Hawthorne effect** (also referred to as the observer **effect**) is a type of reactivity in which individuals modify or improve an aspect of their behavior in response to their awareness of being observed. (acronym: observe the THORNes)
    - The Hawthorne effect occurs when an individual participant changes his or her behavior, specifically due the awareness of being observed.

Agents of Socialization

- Agents of Socialization: Refers to parts of society that are important for socialization (the process of learning the norms and values in a society)
- **Socialization** is a life-long process where we learn how to interact with others. Everything we consider to be normal is actually learned through socialization – how we learn to walk/talk/feed ourselves, and how we learn behavioural norms that help us fit in.
- **Important agents of socialization** – what's used to transmit (pass around) culture, values, beliefs about acceptable behaviors, and beliefs. Agents include people, organizations, and institutions that help us learn about our social world.
    - Examples of Agents of Socialization: popular culture, family, and religion.
    - Our **family** – most important agent of socialization. When you are a child, totally dependent on others to survive. Your parents teach you how to care for yourself, how close relationships work, their beliefs/values/norms, how to talk to others.
        - Malcom Gladwell's Book "*Outlier*" – Looks at how family plays a role in socialization. How wealthy parents raise kids vs. less fortunate parents raise children. One example is trip to doctor's office– wealthy parents encouraged to ask questions, while kids less fortunate unlikely to criticize doctor. Wealthy kids encouraged to challenge authority, while less wealthy kids taught to listen to authority. Shows us how kids are raised and how it affects their interactions with others (in this case authority).
    - **School** is important. Schools teach life skills along with science and math– don't learn from academic curriculum, but learn social skills from interactions with teachers and other students – We learn the importance of obeying authority, act interested, learn to be quiet, to wait etc. Part of the "**hidden curriculum**": standard behaviors that are deemed acceptable that are subtly taught by teachers.
    - **Peers** teach us develop our social behaviours. Peers values and behaviors contradict values of our families/parents at times, and influence us. Peer pressure. How our values of our peers influence us.

        - We must decide on what values to keep and what values to get rid off
        - Ex. Peers pressure us to drink/do drugs as teenagers. What movies/music we watch and listen to.
    - **Mass media** – television, internet, radio, book, magazines. When you are young, you learn things through mass media that parents would not approve of. Today, children are exposed to a lot of content intended for mature audiences – violent TV shows. Enforces gender and other stereotypes. Ex: Children's books is another agent of socialization.

Normative and Non-Normative Behavior

What is Normal? Exploring Folkways, Mores, and Taboos

- Psychologists and sociologists study human behavior and often ask: What is normal? Who decides what behavior is normal? What behavior is strange, and what behavior is criminal? These individuals are studying norms.
- **Norms** are standards for what behaviours, set by groups of individuals, are acceptable, and which are not. Rules that dictate how person should behave around certain group of people – and are defined by that group and usually guided by some sort of moral standard or ethical value that is easily understood and internalized by all members of the group. Provide structure and standards of how people can behave.
    - *Norms vary/are dependent on context, physical locations, culture and by country. Can change with time as individual's attitudes shift or circumstances change to allow certain types of behaviors to be valued.*
        - Ex: At a baseball game you stand up and yell very loudly when your team gets a homerun. At a meeting at work, you do the same thing (yell loudly) – a behavior in this context with those individuals would probably not be acceptable.
        - Ex: can vary country to country/culture to culture: Individuals from America greet each other by saying hello or a handshake, but in European cultures it's customary to kiss on the cheeks.
        - Ex: Can change over time. When baseball began, only men were allowed to play but when men were drafted in WWII, women started playing baseball too which caused a shift in norms. By end of WWII, it was normal for men and women to play baseball.
    - Norms are reinforced by **sanctions** – rewards/punishments for behaviours in accord with or against norms respectively.
        - **Positive sanction** - a reward for conforming to norms.
        - **Negative sanction** - a punishment for violating norms.
        - **Formal sanction** - officially recognized and enforced.
        - **Informal sanction** - unofficially recognized and does not result in specific punishment.

    - **Formal norms** are written down, **informal norms** are understood but less precise and have no specific punishments.
- Norms can be classified into 4 groups: *folkways, mores, laws, and taboos*. Dictate how important the norm is and consequences for deviating for deviating from norm.
    - **Folkways** – the mildest type of norm, just common rules/manners we are supposed to follow on a day to day base. *Traditions individuals have followed for a long time,* ex. opening the door, helping a person who's dropped item, or saying thank you. Not engaging results in a consequences that is not severe/consistent. *No actual punishment.*
        - Ex: Friend's pants zipper is undone. Tell your friend your zipper is undone (common courtesy) but not telling friends leads to no consequences.
    - **Mores** – norms based on some *moral value/belief* (dependent on group's values of right and wrong). Generally produce strong feelings. Usually a strong reaction if more is violated. Ex. Truthfulness (tell the truth because it's the right thing to do, when public figures are not truthful it causes outrage because the figure has done something wrong). *Don't have serious consequences.* Acronym: MOREALS
        - Ex: friends takes of shirt who has painted baseball team's logo on chest. You feel strongly about modesty so you think its wrong that your friend took of shirt and is exposing skin. No serious consequences of your friend's behavior other than your disapproval.
    - **Laws** – *norms still based on right and wrong, but have formal/consistent consequences.* Ex. Public figure lies under oath, done something morally wrong but also violate laws of court. There is a punishment for the crime. Violation can be simple (J-walking) or severe (murder). There is not always outrage when a law is violated – depends on the law.
        - Ex: friends takes of all clothes and decides to go streaking across the field. Broken law and you will receive a punishment. Perhaps not outrage or disgust – crowd might be laughing or cheering.
    - **Taboos –** behaviors completely forbidden/wrong in any circumstance, and violation results in consequences far more extreme than a more. Often punishable by law (with serious legal consequences) and result in severe disgust by members of community. Considered very immoral behavior. Ex. Incest (sexual relationships between family members) and cannibalism (eating human flesh)

Perspectives on Deviance: Differential Association, Labelling Theory, and Strain Theory

- When norm is violated, it's referred to as **deviance**. Not negative, just individuals behaving differently from what society feels is normal. Deviance is relative (just like norms are). Deviance is dependent on context, individuals, group, and country. Deviance standards can change based on these factors.

- Ex. most Americans eat meat, but someone who's vegetarian is deviant in US (their behavior is different than what majority considers as normal)

- **Symbolic Interactionism:** society is a product of everyday interactions of individuals. Looking at how people behave in normal everyday situations and helps us to better understand and define deviance.
- Views of deviance include theory of *differential association, labeling theory, and strain theory.*
- The **Theory of Differential Association** states that *deviance is a learned behavior that results from continuous exposure to others whom violate norms and laws* – learn from observation of others. Rejects norms/values and believes new behavior as norm.
    - Relationships a person forms are very important – if strong relationship to someone deviant (whom provides constant exposure to violated norms), the person is more likely to learn deviance than someone not. Converse is true as well, if they form relationships with someone who follows norms they are less likely to learn deviant behavior.
    - Known as: "as money sees, money do" Money accepts deviant behavior as normal.
    - Ex: elite athlete who grows up believing that cheating is wrong and to be a successful athlete one must train hard, avoid drugs and alcohol, and be respectful to opponents. Elite athlete now switches teams and now new team member believe that using steroids, partying, and heckling is the best way to be successful at a sport. Perhaps even show athlete how to be deviant by demonstrating how to take a particular drug, introducing athlete to steroid, etc. Overtime the athlete will learn from the new team members that these behaviors (partying, heckling, and drug use) are acceptable even though they were not before. Accepts these new deviant behaviors overtime
- **Labeling Theory** – a behavior is deviant if people have judged the behavior and labelled it as deviant. Depends on what's acceptable in that society.
    - Ex. steroids can be labelled as deviant. Not labeled as right or wrong, it is possible that in some situations steroids are necessary. In professional sports – steroid use can be labeled as wrong or unfair and can be considered deviant and subject to critic by others. Deviance is determined by the team members, sporting league, or greater society label.
        - "Perspective on deviance that suggests labels get applied to certain groups or individuals regardless of specific behavior. Adolescents are often subject to stigmatizing labels, leading to perceptions that may not match behavior. Labelling theory calls attention to the power that sterotypes can have in determining how individuals are perceived.
    - Societies reaction to and label for deviant behavior and person who committed the deviant behavior are important
        - **Primary deviance** – no big consequences, reaction to deviant behavior is very mild and does not affect person's self-esteem. Individual is able to continue to behaves in same way without feeling immoral/wrong. Ex. All

athletes of team use steroids, so the act of a player is not labeled as deviant and his actions go unnoticed.
        - **Secondary deviance** – more serious consequences, characterized by severe negative reaction that produces a stigmatizing label and results in more deviant behavior. Ex. Teammates of an athlete label players behavior as deviant and they exclude him from practices and call him a terrible player. Reaction will be he needs to continue to use steroids to be a better player. Reaction might be to use steroids more frequently or try more dangerous forms of drug. Repeated deviance gives him a reputation of deviance and the stigma of deviance stays with him for the rest of his career
- **Strain Theory** – if person is blocked from attaining a culturally accepted goal, may become frustrated/strained and turn to deviance. Individuals in a group are pushed to attain certain goals, but may not have means or legitimate ways to achieve success. Society values a certain behavior but the opportunity to be successful is not made available to everyone. The lack of equal opportunity results in increased access to illegal means to achieve success.
    - **Ex**: athlete attends a school that doesn't have proper baseball training equipment or no coach, or funding. Athlete becomes frustrated and turns to deviant behavior. School lacks the resources, so athlete tries steroids to level the playing field.

Aspects of Collective Behavior: Fads, Mass Hysteria, and Riots

- Previous video: norms and deviance and how changes in norms can occur at the individual level.
- What happens when large numbers of individuals rapidly behave in ways that are not inline with societal norms? In sociology, this is called *collective behavior*
- **Collective behavior** is <u>not the same as group behavior</u>, because of a few reasons.
    - First, collective behavior is time-limited, and involves **short social interactions**, while groups stay together and socialize for long period of time.
    - Collectives can be **open**, while groups can be exclusive.
    - Collectives have **loose norms** (which are murkily defined), while groups have strongly held/well-defined norms.
- Collective behavior violates generally violates widely held societal norms and it times it can be very destructive.
- Collective behavior is often driven by group dynamics, such as deindividualization. Certain group dynamics can encourage people to engage in acts they may consider wrong in normal circumstances, which also occur in a collective.
- Sociologists have identified 3 types of collective behavior: **fads, mass hysteria**, and **riots**.
    - **Fad** – "fleeting behavior" is something that becomes incredibly popular very quickly, but loses popular just as quickly. Last for short period of time, but reach

influence of large # of people in that time. Not necessarily in line with normal behavior. Perceived as cool/interesting by large group of people.

- Ex. is a "cinnamon challenge" – person has to eat large spoonful of ground cinnamon in under a minute and posting video online.

- **Mass hysteria** is large # of people who experience unmanageable delusions and anxiety at same time. Reactions spread rapidly and reach more people through rumours and fears. Often takes the form of panic reactions and negative news or potential threat.
  - **Mass hysteria** refers to behavior that occurs when groups react emotionally or irrationally to real or perceived threats. It is characterized by panic and spread of information (or misinformation) by the media.
  - Ex. Mild-form of hysteria: Reaction due to news of severe weather warnings. The result is fear/anxiety induced in large #s of people and the fear causes people to become crazed (rush to supermarket), drive erratically and become irrational
  - **Mass psychogenic illness, or epidemic hysteria**: Mass hysteria can be a result of of psychology, like when large amount of people believe they have same illness despite lack of disease.
    - Ex. after anthrax attack in US, after reports there were over 2000 false alarms. Individuals reported false symptoms of anthrax infection and because they believed they were exposed (which induced false symptoms).
- **Riots** – characterized by large # of people who engage in dangerous behavior, such as vandalism, violence, or other crimes. Riots are very chaotic and cost cities millions in damages. Individuals who act case aside societal norms and behave in very destructive ways, and violate laws indiscriminately (ruin property, steal, etc). Often seen as a collective act of defiance/disapproval, and can be result of a perceived issue (ex. sports game outcome, frustration of working/living conditions or conflicts between races/religions). Cause of act can be legitimate, the group acts out in ways that are illegal/damaging to society as a whole.
  - **A riot is a violent form of crowd behavior that results from feelings of injustice or feeling that needs have been ignored. Riots typically result in property damage and other significant crimes.**
- A mob is a group of individuals who are emotional and violent, but target specific individuals or categories of individuals.

Learning

Types of Learning

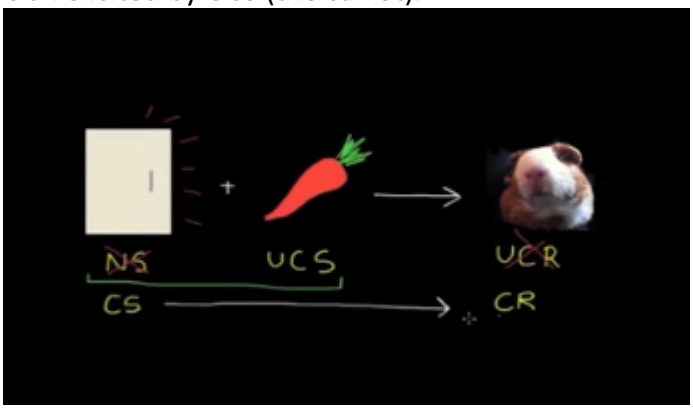
- **Non-associative learning** – when an organism is repeatedly exposed to one type of stimulus, ex. **habituation** and **sensitization**. In habituation, person tunes out the stimulus. **Dishabituation** occurs when previously habituated stimulus is removed. **Sensitization** is increase in responsiveness to a repeated stimulus.
- **Associative learning** – when one event is connected to another, ex. classical and operant conditioning.

Classical Conditioning: Neutral, Conditioned, and Unconditioned Stimuli and Responses

- Example: Pet Guinea pig gets excited about carrot at first (natural). When first giving carrot to guinea pig, had to open a refrigerator to get the carrot out, the opening of which makes a loud sound. After time, guinea pig gets excited just at refrigerator door opening/the sound of the refrigerator opening (even before carrot was given). Same with every other time refrigerator door opened. This process is called classical conditioning.
- **Classical conditioning** (also known as **Pavlovian** or **respondent conditioning**) is a learning process in which an innate response to a potent stimulus comes to be elicited in response to a previously neutral stimulus; this is achieved by repeated pairings of the neutral stimulus with the potent stimulus.
    - "I am conditioning myself to like it" is the same as "I am learning to like it"
- **"S" = Stimulus –** Anything that stimulates your senses (anything you can hear, see, smell, taste, or touch.
- Stimuli can produce a **response –"R"**
- Classical does not involve change in behaviour like operant conditioning.
- In example:
- Carrot is an **unconditioned stimulus (UCS)** because no one had to teach guinea pig to like carrots. The UCS triggers a response, called an **unconditioned response (UCR).** The response in this case was an excitement in guinea pig (a normal physiological response.
    - Unconditioned means it's innate, already do naturally, and not learned.
    - While conditioned means it's a learned behavior.
- Right before guinea pig got carrot, heard refrigerator door sound– a **neutral stimuli**: a stimuli you can sense by sight, taste, or hearing it that typically doesn't not produce the reflex that is being tested. In this example, the sound of the refrigerator door can be heard, but it does not naturally cause excitement. It is something that had to be learned.
- Conditioning is produced when the neutral stimulus is presented shortly before the unconditioned stimulus – presentation of both stimuli is caused a **trial**. Pairing the two stimuli together is how you establish classical conditioning. Occurs when neutral

stimulus (refrigerator door) is able to elicit the same response as the unconditioned stimulus (the carrot)

- Ex. guinea pig was conditioned to respond to sound of refrigerator door.
- Refrigerator door (neutral stimulus) becomes the **conditioned stimuli**, because it elicits a **conditioned response** (excitement). The excitement was previously a UCR elicited by UCS (the carrot).



- Pavlov's Dog is another classical example.

Classical Conditioning: Extinction, Spontaneous Recovery, Generalization, Discrimination

- Recall last experiment, guinea pig also responds (gets excited) to desk door opening because it sounds similar (but different) to the refrigerator door. This is termed generalization.
- **Generalization**: tendency/ability of a stimulus similar to conditioned stimulus to elicit a conditioned response, and more similar the stimulus is to original conditioned stimulus - the greater the conditioned response.
  - Has an adaptive value.
  - Generalization allows us to make appropriate response to similar stimuli. Ex. meeting someone new who smiles, reminds us of other smiles (both exhibit feelings of joy).
- Guinea pig doesn't respond to dresser drawer, which makes a sound that is different from refrigerator, this is called **discrimination**, when you learn to make a response to some stimuli but not others. Also has an adaptive value because you want to respond differently to related stimuli.
  - Ex: You wouldn't want to respond to all loud sounds in the same way. You probably want to respond differently to a loud bang of drum vs loud bang of gunshot
- If you open refrigerator door and give the Guinea pig get a carrot anymore, over time she would no longer react – **extinction**. When a CS does not elicit a CR anymore.

    - It is used to train certain phobias. Ex. If you are afraid of heights, the therapist would expose you to various heights and the stimuli would not elicit the same response anymore (the response of fear)
- But suddenly she hears refrigerator door open later, and makes a response (a milder form like feeling intrigued more than usual instead of a strong feeling of excitement)– **spontaneous recovery** (when old conditioned stimulus elicits response). Don't know why it happens, usually infrequently, doesn't persist for a long time, and less strong.
- In classical conditioning, behavior that is typically in response to one stimuli becomes the response due to another stimulus (due to pairing)
- **Extinctive Burst: When an animal no longer receives regular reinforcement, its original behavior will sometimes spike (meaning increase dramatically) - this is known as an extinction burst.**
    - While extinction, when implemented consistently over time, results in the eventual decrease of the undesired behavior, in the short-term the subject might exhibit what is called an *extinction burst*. An extinction burst will often occur when the extinction procedure has just begun. This usually consists of a sudden and temporary *increase* in the response's frequency, followed by the eventual decline and extinction of the behavior targeted for elimination. Novel behavior, or emotional responses or aggressive behavior, may also occur.[Take, as an example, a pigeon that has been reinforced to peck an electronic button. During its training history, every time the pigeon pecked the button, it will have received a small amount of bird seed as a reinforcer. So, whenever the bird is hungry, it will peck the button to receive food. However, if the button were to be turned off, the hungry pigeon will first try pecking the button just as it has in the past. When no food is forthcoming, the bird will likely try again ... and again, and again. After a period of frantic activity, in which their pecking behavior yields no result, the pigeon's pecking will decrease in frequency.
- Other things to know:
    - Classical conditioning usage in therapy:
- ***Aversive Conditioning***: Aversive conditioning is usually used to stop a particular behavior. The process involves pairing a habit a person wishes to break, such as smoking or bed-wetting, with an unpleasant stimulus such as electric shock or nausea. If I wanted to stop Shanikwa from smoking I could shock her every time she smokes. The shock is the UCS and the pain is the UCR. Once the smoking becomes associated with the electric shock (acquisition), Shanikwa will experience pain when she smokes, even without the shock. Thus the smoking will become the CS and the pain the CR (but only if the shock is no longer given).
- ***Systematic Desensitization***: Systematic Desensitization was developed by Joseph Wolpe and is a process that involvers teaching the client to replace feelings of anxiety with relaxation. It works great with phobias. If Akira has a horrific phobia of spiders, the therapist will teach Akira relaxation techniques (or give Akira a magical feel good drug). Slowly spiders are introduced to Akira. First maybe just a picture, then one in a cage, then one outside of a cage etc... The goal is to get Akira to associate spiders with

the drugs or relaxation techniques. Eventually, seeing a spider will cause Akira to relax (in theory).
    - Most of the time, systematic desensitization occurs gradually, but some therapists use a technique called ***implosive therapy***. Here they throw Akira in a room with thousands of spiders with the idea that if they face their fear and survive, they will realize their fear is irrational. This technique often produces a lot of anxiety.
- **Counterconditioning**: **Counterconditioning** (also called **stimulus substitution**) is a form of respondent conditioning that involves the conditioning of an unwanted behavior or response to a stimulus into a wanted behavior or response by the association of positive actions with the stimulus.
    - Counter conditioning is very similar to extinction seen in classical conditioning. It is the process of getting rid of an unwanted response. But in counter conditioning the unwanted response does not just disappear, it is replaced by a new, wanted response. "The conditioned stimulus is presented with the unconditioned stimulus". This also can be thought of as stimulus substitution. The weaker stimulus will be replaced by the stronger stimulus. When counter conditioning is successful, the process can not just be explained by simply substitution of a stimulus. It usually is explained by things such as conditioned inhibition, habituation, or extinction.
    - It is a common treatment for aggression, fears, and phobias. The use of counter conditioning is widely used for treatment in humans as well as animals. The most common goal is to decrease or increase the want or desire to the stimulus. One of the most widely used types of counter conditioning is systematic desensitization.
- Extinction occurs in both operant and classical conditioning.
- Phobic responses are acquired through classical conditioning.

Operant Conditioning: Positive and Negative Reinforcement and Punishment

- Associated with **B.F. Skinner**
- **Operant conditioning** ALSO CALLED **Instrumental Conditioning** focuses on the relationship between behavior and their consequences, and how those in turn influence the behaviour (classical conditioning no change in behaviour)
- In operant conditioning, behaviours have consequences – two types: **reinforcement** (increase a behavior) and **punishment** (decrease a behavior). Two types of reinforcement (positive and negative) and two types of punishment (positive and negative).
    - We will use the example goal: safe driving.
    - **Positive reinforcement** = something is being added to <u>increase tendency</u> of behavior, ex. a gas gift card for safe driving
    - **Negative reinforcement** = taking something away to <u>increase tendency</u> behavior will occur again. Ex. taking loud buzzing noise away only once you put your

seatbelt on. Taking away sound of buzzer when you put on seatbelt is negative reinforcement, because taking something away in effort to increase behavior (putting a seatbelt on)
    - **Positive punishment** = Positive punishment means something is added to decrease tendency something will occur again. Ex. giving a speeding ticket (adding) to decrease behavior of speeding (behavior).
    - **Negative punishment** = something taken away in effort to decrease tendency it'll occur again. Ex. taking away your license.
    - All these consequences **shape** (influence) the behavior
    - **The immediacy of feedback is an important factor in influencing behavior.**
- **Primary reinforcers** are innately satisfying/desirable, like food, water, sexual activity
- **Secondary reinforcers** are those learned to be reinforcers, such as previously neutral stimuli. Requires a pairing or association with a primary reinforcer for it to have value. Ex. money
- **Token economy** – system of behaviour modification based on systematic reinforcement of target behaviour, reinforcers are "tokens" that can be exchanged for other reinforcers (ex. Prizes).
- **Operant Extinction**: In operant conditioning it results from some response by the organism no longer being reinforced (for example, you keep getting your dog to sit on command, but you stop giving it a treat or any other type of reinforcement. Over time, the dog may not sit every time you give the command).
- **Instinctual drift:** it is the phenomenon whereby established habits, learned using operant techniques, eventually are replaced by innate food-related behaviors. So the learned behavior "drifts" to the organism's species-specific (instinctual) behavior.
    - **Instinctive drift** or **instinctual drift** is the tendency of an animal to revert to instinctive behaviors that interfere with a conditioned response. The concept originated with B.F. Skinner's former students Keller Breland and Marian Breland when they tried to teach a raccoon to put tokens into a piggy bank. Instead, the raccoon drifted to its instinctive behavior of putting the tokens on the ground or turning them over in its paws, as they often do with food
- How is motivational state defined? By depriving the subject of some desirable stimulus for a period of time.
- Extinction: both in operant conditioning and classical conditioning.

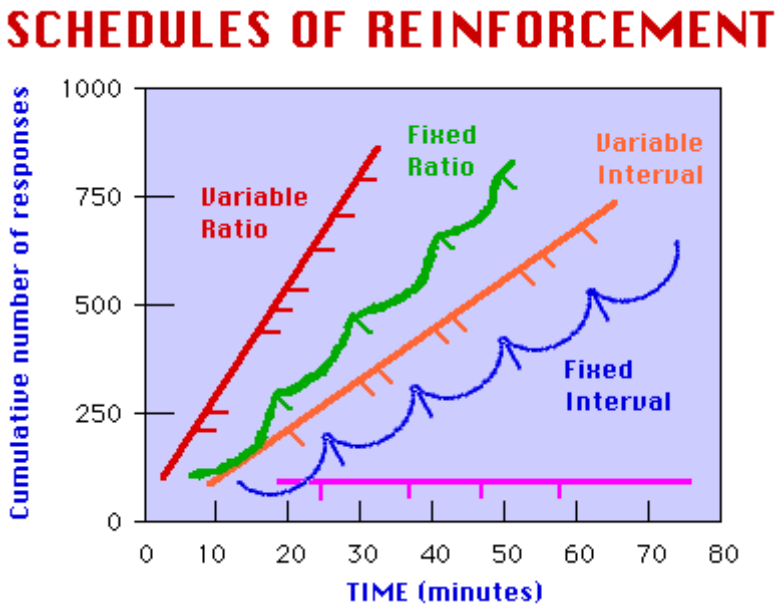
Operant Conditioning: Shaping

- "I want to learn to do a headstand" – emphasize **learn**. Learning through successively reinforcing behaviors that approximate the target behavior is **shaping**.
- What is the **target behavior?** The final behavior you wish to train. Ex. headstand.
    - Showing up to yoga class, won't necessarily make you learn it.
    - Next, put hands on mat (downward dog). Then forearms on mat. Each is then reinforced behavior until next step.
    - Finally, put legs up – the target.

- **Example of Shaping:** To teach a bird to perform a complex task (spin in a circle and press a button) you might reward it at varying steps through the process over time. So, for example, you might give it a treat every time it turns a little. After a while you only give it a treat when it makes a full circle. After this you only give it a treat if it makes a full circle and maybe bends towards the button. Finally, you reward the bird only for completing the full task. In this way, it learns to perform a different part of the task in small intervals. Another example is a dog who can shake hands/roll over on commands.

Operant Conditioning: Schedules of Reinforcement

- Most of our behaviours are on **a *partial reinforcement schedule*** – behavior is reinforced only some of the time. More resistant to extinction than continuous reinforcement. Behavior is shaped through a process of successive reinforcement of approximations of target behavior.
- **Continuous reinforcement** becomes less reinforcing so there is a need for ulterior reinforcement. Continuous reinforcement occurs on a 1:1 ratio - this means that for each behavior, there is a reward. Discovered by B. F. Skinner via reward schedules with animals but apply to animals as well.
- **Fixed-Ratio** – acronym: Ration = RATION = AMOUNT (of responses). FIXED = Consistent ex. car salesman gets bonus every 5 cars he sells. Reinforcement only occurs after a fixed # of responses. Contingent on # of cars sold *regardless* of how long it takes (so the salesman will probably try to sell as fast as possible). Jobs that demand someone to work in a fast paced manner typically pay workers on fixed-ratio (ex. Factory workers, fruit pickers)
- **Fixed-Interval –** acronym**:** Interval = TIME. ex. receives pay check every 2 weeks – in this case, time is constant. Pay doesn't change if he sells 1 car or 100 cars. Less incentive to sell cars. Response rate is slower.
    - **Variable-Ratio** – acronym: Variable = VARIATION. Reinforcement is delivered after average # of right responses has occurred. Similar to fixed-ratio, except # changes for each reward. Just fixed-ratio but varies. Average # of correct responses is the same. Ex. bonus is paid after selling 5 cars for first bonus, 3 for second, 7 for third, 6, then 4 etc. Average is 5. Lots of uncertainty. Car salesman can't predict when he will get a bonus.
    - Another example is slot machine. You don't know if the next pull will be the jackpot (because it makes it very difficult to walk away from something).
- **Variable-Interval** – Responses are reinforced after a variable amount of time has passed, regardless on amount Ex. bonus can come randomly on different days.
- VR is most effective (acronym: produces a **V**ery-**R**apid response)



Operant Conditioning: Innate vs. Learned Behaviours

- Innate behaviours (instincts) vs. learned behaviours
- Innate behavior is performed correctly the first time in response to a stimulus – they innately possess. Commonly called "Instinct".
    - Simple innate behaviors– **reflexes** (squint or blinking – natural behaviors), **taxis** (bugs fly towards light, can be towards or away from stimulus – a purposeful movement ||acronym: Taxis have a purposeful movement), **kinesis** (rats randomly scurrying in different directions – no purpose of movement). [example was a light source as being the stimuli]
    - Complex innate behaviors – **fixed action patterns** (mating dance), **migration** (birds flying south in winter), **circadian rhythms** (biological clock, waking up early to sing) [example was a singing bird]
- Learned behaviours are learned behaviors through experience.
    - **Habituation –** response to alarm decreases over time. Ex. curing phobia by repeated exposure to the fear until intensity of emotional response decreases. "Loss of response to repeated stimuli"
    - **Classical conditioning –** associate one stimuli with another stimuli that produces a specific response. Ex. freaking out (CR) because of a fire alarm because the fire + fire-alarm (CS) are paired stimuli. The UCS was the fire (which you have a natural response too).
    - **Operant conditioning –** consequences that follow behavior increase/decrease likelihood of behavior happening again
    - **Insight learning** – solve a problem using past skills, the "aha" moment is insight learning. Ex. Use math skills previously learned to solve a problem
    - **Latent learning**- learned behaviour is not expressed until required

- **Innate Learning**: fixed action patterns that are “hard wired”

Operant Conditioning: Escape and Avoidance Learning

- *Escape and avoidance/ avoidant learning* are 2 types of **aversive control**, situations where behavior is motivated by threat of something unpleasant – examples of negative reinforcement (removing undesirable stimulus following correct behavior)
    - **Escape** – escape an unpleasant stimulus once it has occurred (the stimuli has an element of surprise usually). The response is conditioned (of escaping) in response to a stimuli and then stimuli goes away. (negative reinforcement). Typically, the response would not occur. Fire in a building, and you have to find a way to get out.
        - *Escape* conditioning occurs when the animal learns to perform an operant to *terminate an ongoing, aversive stimulus*. It is a "get me out of here" or "shut this off" reaction, aimed at escape from pain or annoyance. The behavior that produces escape is *negatively reinforced* (reinforced by the elimination of the unpleasant stimulus).
    - **Avoidance** – signal is given before aversive situation. The behavior is to avoid the situation, which results in continued avoidance because it is reinforced by the removal of the pain/undesirable stimuli. Ex. A fire alarm allows you to avoid the fire and you are able to “Avoid” the situation.
        - Avoidance behaviors are incredibly persistent. This is true *even when there is no longer anything to avoid*. The reason is that an animal that performs an avoidance reaction never experiences the aversive stimulus. But it receives negative reinforcement in the form of *relief*. Because of this, avoidance behavior is *self-reinforcing*. Negative reinforcement.
    - Side note:
        - Drive-reduction – negative reinforcement
        - Incentive – positive reinforcement

xObservational Learning: Bobo Doll Experiment and Social Cognitive Theory

- See above

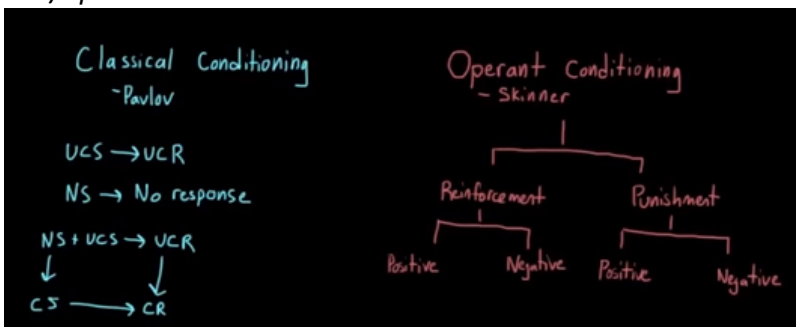
xLong Term Potentiation and Synaptic Plasticity

- See above

Non Associative Learning

- Ex: you are sitting in a bedroom and you hear a thunder clap which results in you jumping out of your bed. What would happen? Three options: habituation, sensitization, or the same response due to the stimuli.

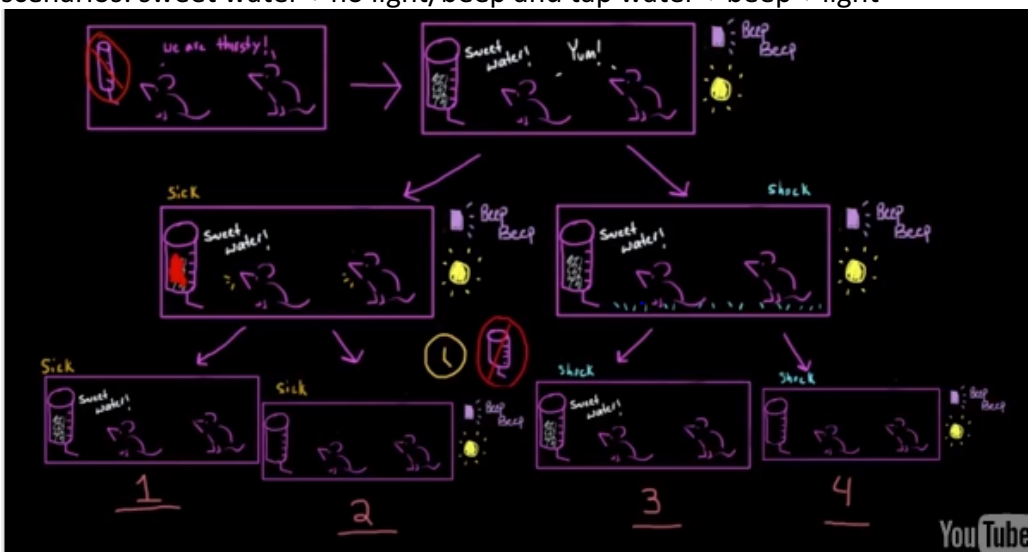
- **Sensitization** and **Habituation** are the two forms of *non-associative learning* **–** learning where no punishment/rewarding is occurring with increase/decrease of response. You are simply noticing how response changes in relationship to the same stimuli over time.
- In response to series of stimuli of thunderclaps you have three options:
    - Same response – you jump equally as high with each subsequent stimulus. (ex: you jump same distance out of bed with each thunderclap)
    - *Become **habituated** - t*he same stimuli results is a decreased response with episode of stimuli (ex: you begin jump lower distance over time)
    - You could become ***sensitized***, the same stimuli there is an increased response. Opposite of *habituated.*
        - **Sensitization** is a non-associative learning process in which repeated administrations of a stimulus results in the progressive amplification of a response. Sensitization often is characterized by an enhancement of response to a whole class of stimuli in addition to the one that is repeated. For example, repetition of a painful stimulus may make one more responsive to a loud noise.
- *Recap of classical/operant:*

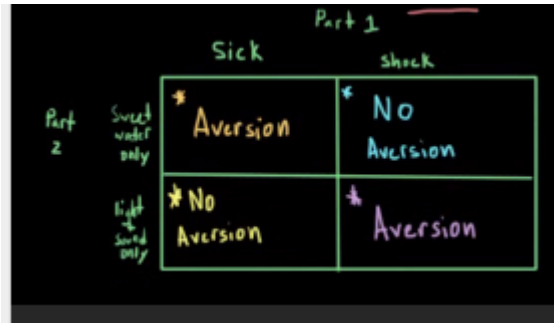


Biological Constraints on Learning

- Researchers thought that classical condition and operant condition were all types of learning that applied across the board. But there are some biological limitations – animals were prepared to learn some kinds of associations with different degrees of difficulty
- They discovered that it was easy to learn associations that were part of their natural world but not easy to learn associations that were not.
- **Taste aversion** – when you eat something because you like it, but then stop eating it because you become sick (have a bad experience). Aversions are strong, and they don't always make sense. Ex. You are eating cilantro and really like it but get sick from it. Then start hating cilantro. Also could be the chicken you were eating actually caused the sickness, but you started hating the cilantro anyways. Body connects the fact that the sickness was a result of food – not other attributes of the environment when you ate. You are more likely to get sick because of food, so the association is learnt quickly

- How was this studied in a lab? Rats were deprived of water, and then rats were given sweet water afterwards. Each time they got water, a light flashed and a sound beeped.
  - In a first group, a substance that makes them ill is added to sugar water
  - In another group nothing is added to the sugar water (but get electric shocks instead)
  - After some time, this occurs again. The same rats are made sick in first group are put into two scenarios: sweet water + no light/beep and tap water + beep + light
  - The same rats were shocked in the second group are put into two scenarios: sweet water + no light/beep and tap water + beep + light





  - Top left box: If you get physically sick…you probably ate something bad. You avoid the food again (the sweet water).
  - Bottom left box: You don't pair the beep + light with getting sick, only the sweet water. In this case the water is normal so no aversion to it
  - Top right box: Getting shocked was due to environment that is now removed so the sweet water is not what caused the harm. You show no aversion to the sweet water.

        - Bottom right box: You show aversion because the environment is still present to cause harm. You show aversion to even tap water.
    - Study showed that not all associations were equal and animals don't make associations in all circumstances.
        - "if you get physical sick…you probably ate something bad
        - "If you get physically injured, it was probably caused by something in the environment"
- Phobias: another example of a biological influence on learning. We are more likely to develop phobias to something that impacted our ancestors rather than things that might be dangerous to us in the real world. Very likely to have a phobia against heights, snakes, spider but are unlikely to have a phobia to a car or electric outlet (even though you are more likely to be hurt by these factors today than the phobias that most people have). It used to be evolutionary advantageous to have the adaptive value to avoid food that made you sick, spiders, snakes, heights in the past – so they are passed on.
- *Adaptive associations (those who have a biological advantage) are learned faster than learning with no biological value. Learning is not simply classical and operant conditioning.*

Theories of Attitude and Behavior Change

xComponents of Attitude

- See above

xAttitude Influences Behavior

- See above

xBehavior Influences Attitude

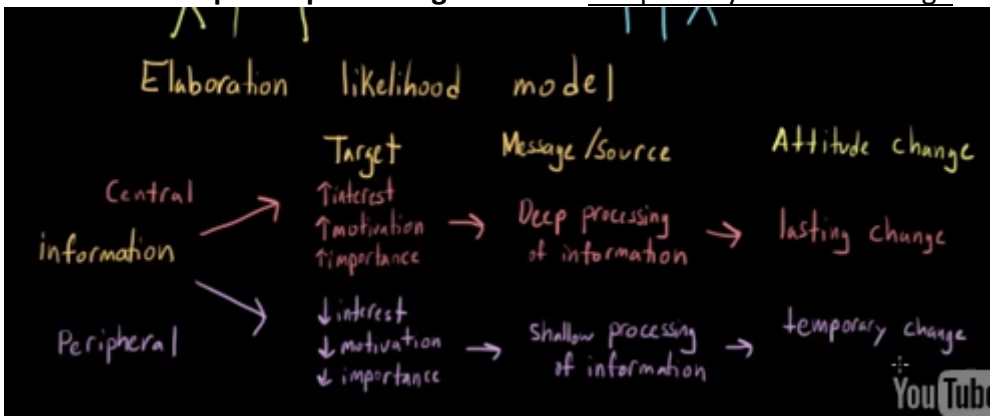
- See above

Persuasion, Attitude Change, and the Elaboration Likelihood Model

- **Persuasion** is a method for attitude/behavior change. The **elaboration likelihood model** explains how attitudes are formed and likely they are to be changed. The target characteristics are the most important in this model, but all play a factor (message and source characteristics as well). Determines when people will be influenced by the content of a speech vs. more superficial features.
- 3 main characteristics that impact on how we are persuaded for/against a message:
    - 1) **Message characteristics** – message itself, clarity, was it logical, how well thought message it. Also includes how well written it was, does speaker have good grasp of grammar, appropriate vocabulary, length of talk, etc.

- 2) **Source characteristics** – the environment around the message and the speaker's background. What is their level of expertise of speakers around us – do they seem knowledgeable, trustworthy, and is information credible or not. Where does the information come from – internet poll, street poll, or a psych journal. Physical environment, venue of event (campus or a bar).
- 3) **Target characteristics** –characteristics of listener such as mood, self-esteem, alertness, intelligence, etc. How we receive a message.

- According to **elaboration likelihood model**, we want to evaluate information along two possible paths: **central** and **peripheral routes**. After a route is chosen, information is passed through three different stages. Stages:
  - Stage 1: Pre-Processing stage due to target characteristics: before we can consider information or be persuaded by it, the information is first filtered by *interest, motivation, importance*, etc. of us (the listener).
    - **Central Processing:** If listener interest, motivation, importance are high. People will only choose this route when they are interested in the topic.
    - **Peripheral processing**: If listener interest, motivation, importance are low we process via the peripheral route. Chosen when listener doesn't care about topic,
    - We Filter information before we can even process it.
  - Stage 2: Processing Stage by message/source:
    - **Central Processing: F**ocus on a deep processing of the information.
    - **Peripheral processing**: Focus on superficial characteristics (shallow processing of information) such attractiveness of speaker, their PowerPoint attractiveness, or even how many points the speaker made. How many times speaker got audience to laugh, etc.
  - Stage 3: Change in attitude
    - **Central Processing**: creates a lasting attitude change
    - **Peripheral processing**: creates a temporarily attitude change



Reciprocal Determinism

- **Reciprocal determinism** is the interaction between a person's behaviours, personal factors (motivation/cognition), and environment are all determined by one another

- The **Social-Cognitive Theory** view behaviours as being influenced by people's traits/cognitions and their social context. Talking about interactions between individual and situation they're in.
    - Cognition -> Environment -> Behavior (the order can change as well)
    - Ex. Meg is interested in soccer (**cognition**), joins a soccer team (**environment**), and spends time with soccer players (**behavior**). Cognition -> Environment -> Behavior
        - Or, she can spend a lot of time with soccer players (behavior), become interested in it (cognition), and joins a soccer team (environment). Behavior → Cognition → Environment
        - Or, she hangs with soccer players (behavior), so she joins a soccer team to hang out w/ them more (environment), and then after playing for a while develop a real interest in soccer (cognition). This then reinforces her hanging with the team. Behavior → Environment → Cognition.
- This theory was developed by **Bandura** (same scientist who did work on observational learning). Our learning is through observation of others, and observation of behavior of others.

Personal Control (Locus of Control, Learned Helplessness, and the Tyranny of Choice)

- **Perceived behavior control**: refers to a person's ability to carry out intentions to perform a certain behavior.
- Important element of social cognitive theory is personal control. Are we controlling or are we getting controlled by the environment around us? Is our locus of control: Internal or external?
    - I should have studied harder – **internal locus of control**, can control fate of own destiny
    - That was an unfair test – **external locus of control**, perceive outside forces that help to control your fate.
    - Therapy can be used to try to encourage a patient to attribute problems or internal controllable factors rather than external factors or uncontrollable internal factors.
- Those internal achieve more in school/work, cope better with stress and lower depression. External do not as well and higher rates of depression.
- **Learned helplessness** – when tone is sounded dogs receive electric shock, but could press button to stop the shock. Group 2 had no way to turn off the shocks.
    - After, dogs placed in new environment and had 2 sides separated by low partition in middle. Given electric shocks, but dogs in group 1 learned to escape shock by jumping over barrier. Dogs in group 2 didn't try to escape the shock.
    - Therefore, uncontrollable bad events can lead to a **perceived** lack of control, which leads to general helpless behavior.

- Increasing people's control over very small things, like TV remote can increase the health and well-being of people in nursery homes.
- What about too much control? Too many choices can also negatively impact our cognition and behavior – the **tyranny of choice**.
    - Ex. too many choices at stores
    - Those who had to pick 1/6 were more satisfied with their behavior, those who had to pick 1/30 less happy with their choice.
    - One result is **information overload**, and can lead people to **decision paralysis** and **increased regret** over choice made.
- Personal control is important; any control people have on environment even a little has good effect on well-being. On other hand too much is not good either.

Self-Control

- **Self-Control:** The ability to control our impulses and delay gratification. Influences how we behave.
- Humans have natural **desires:** motivations associated with pleasure or release from displeasure. Aren't necessarily bad (ex. Desire to drink water to live). When they become a **temptation**: when desire conflicts with values or long term goals. (ex. Wanting to eating a candy bar while having the long-term goal of losing weight, or watch a series on Netflix vs. graduating with your PhD).
    - So self-control is focussing on long-term goals while putting off short-term temptations.
- The most famous experiment of self-control is commonly referred to as the **marshmallow test**. Kids in preschool given marshmallow and could eat it whenever, but if they waited 15 minutes they could get another marshmallow (total of 2! – they would have to forego immediate gratification and wait for a better reward).
    - Some ate it right away, but other kids licked it.
    - Those who were able to wait tended to have better life outcomes when followed 10 years later (higher SAT scores, lower drug use, fewer relationship problems, better social skills, less stress, better grades, eat better, smoke less).
- Self-control improves management in all areas of life
- **Ego depletion** – idea that self-control is a limited resource. If you use a lot of it, it can get used up, and less of it to use in the future which can affect a later unrelated task that also requires self-control. This is true because self-control requires lots of energy and focus.
    - Demonstrated by experiment that those who resisted eating cookies ended up giving up sooner on another unrelated task that also requires self-control than those who didn't resist.
    - Muscle is used as a metaphor for self-control. Can be strengthened with practice, but can also be fatigued/depleted with overuse.
    - If you work in a task that requires lots of self-control, make sure you get a lot of sleep/rest afterwards.

- Training self-control in one area can improve it in other areas. Ex. Exercise if you don't want too.

- How to improve <u>self-control</u>
  - 1) <u>Change environment</u> – make object of your temptation harder to get while making better/healthier options easier to get. ex. Moving unhealthy snacks to more difficult to reach shelf than the healthy snacks. [This surprisingly head a great effect] *make good choices easier to reach.*
  - 2) <u>Operant conditioning</u> – reinforcing good behaviours with rewards. Positive/negative reinforcement or punishment. Ex. Watch an episode on Netflix for each segment of dissertation completed (positive reinforcement) or preventing a beeping on your computer as you typed into MSWord (negative reinforcement) to increase work to get a reward/avoid an annoying stimuli. Punishment – turn off internet to decrease behavior of watching Netflix. *Reward good behavior + Punish bad behavior*
  - 3<u>)</u> <u>Classical conditioning</u> – ex. eat healthy snack every time you crave chocolate and over time you might start craving healthy snacks. *Refocus desires to something more in line of long term goals.*
  - 4) <u>Deprivation?</u> – Removing the object of temptation completely is problematic. Can make you want it more, and leads to ego depletion (takes lot of effort to deprive of yourself something completely). This is probably why those on strict diets are likely to fall to temptation.

Individuals and Society

Self-Identity

Self Concept, Self Identity, and Social Identity

- **Self-concept** aka Self Identity - is how someone thinks-about/perceives/evaluates themselves, aka self-awareness.
    - Derived from self-esteem and self-efficacy (talked about in next video)
    - Development of self-concept has **2 parts**: first, an **existential** self and then a **categorical** self.
    - **Existential self** is most basic part of self-concept, the sense of being **separate** and **distinct** from others. Awareness that the self is **constant**/consistent throughout life (Ex: if someone says they are "tired" that isn't them All the time. This is NOT their self-concept because self-concept is Consistent)
        - Child as young as 2-3 months realize they exist as distinct entities due to the relationship child as with the world. When someone smiles, someone smiles back. They have a relationship with objects and they are separate/distinct from that.
    - **Categorical self** comes once baby realizes they're separate (comes after existential self)– becoming aware that even though we're separate/distinct objects/beings, we also exist in the world with others. And each of these objects/entities has properties. Ex. **age** and **gender** are the first categories first babies learn, then **skills** and **size**. Then, as we grow older, compare ourselves with others – **traits**, **comparisons**, **careers** (these are more developed categories)
    - **Carl Rogers** (Humanistic Theory), believed self-concept had 3 different components.
        - **Self-image**: what we believe we are. The view we have of ourselves.
        - **Self-esteem/self-worth**: how much value we place on ourselves
        - **Ideal-self**: what we wish/aspire to be
        - When the ideal self and real self are similar, the result is a positive self-concept. When the ideal self does not match the real self, the result is **incongruity**.
        - Explain actions through self-concept and incongruence
- We can use the **social identity theory** to develop self-concept further – has 2 parts: **personal identity and social identity**
    - **Personal Identity:** things unique to each person like personality traits
    - **Social Identity:** includes the groups you belong too in our community.
    - Mental process involved in how we categorize ourselves/use social-identity theory. Process involved 3 steps. This process is used when we categorize

ourselves, others, and look at the relationship between personal and social identities.

- **Step 1:** All humans **categorize** ourselves and others without really realizing it, part of human nature. Categorize in order to understand objects/identify them ex. Categorize to groups (which we belong to and those different) like *race* (black, white)/*job* (student/accountant)/etc.
    - If we assign categories to others, we can make pre-judgements about them.
- **Step 2:** Next is **identification**. When we adopt identity of the group, we see/categorize us as belonging – behaving and acting like the category we belong to, ex. a student. (ex. Act and behave like a student if we identify as students. The role starts to feel like a norm). Emotional significance to identification - our self-esteem starts to become bound with this group identification and sense of belonging.
- **Step 3**: social **comparison** – how we comparing ourselves with other groups (or two different groups). We do this to maintain our self-esteem. Critical to understanding of prejudice, because once two groups develop as rivals, we start to compete in order to maintain self-esteem.

Self-Esteem, Self-Efficacy, and Locus of Control

- **Self-esteem** is the respect and regard one has for oneself
    - **Self worth vs self esteem:** greater than all of those things". It is a deep knowing that I am of value, that I am loveable, necessary to this life, and of incomprehensible worth. It is possible to feel "high self-esteem," or in other words, to *think* I'm good at something, yet still not feel *convinced* that I am loveable and worthy. Self-esteem doesn't last or "work" without self-worth.
- **Self-efficacy** – belief in one's abilities to succeed in a situation / to organize and execute the courses of action required in a particular situation. Developed by Bandora due to his dissatisfaction with idea of self-esteem. Self-efficacy is a more specific than self-esteem. Can have an impact on everything from psychological states, to behavior and motivation. All people can identify goals they want to accomplish, things they want to achieve. Most people realize that putting plans into action is not so simple. Self-efficacy plays a role in how individual goals, challenges are approached.
    - Two types of self-efficacy. Strong and weak.
    - People with **strong** self-efficacy **recover** quickly from setbacks, have strong/deep interest, **strong sense of commitment** to activities, and **enjoy** challenging tasks (Acronym: **RISE. R=Recover, I= Interest, S=Strong** sense of commitment**, E = Enjoy** challenging tasks)
    - People with **weak** self-efficacy focus on personal **failures**/negative outcomes, **avoid** challenging tasks, quickly **lose** confidence in personal abilities, and believe they **lack** the ability to handle difficult tasks and situations (Acronym: **FALL, F=**

failures, A= Avoid challenging tasks, **L=lose** confidence, **L=Lack** ability to take on complex tasks)
    - Look at *4 sources* to determine if person has strong/weak sense of self-efficacy:
        - 1. **Mastery of experience** – strengthens self-efficacy
        - 2. **Social modeling** – seeing people similar to ourselves complete the same task increases self-efficacy
        - 3. **Social persuasion** – when someone says something positive to you, helps overcome self-doubt.
        - 4. **Psychological responses** – learning how to minimize stress and control/elevate mood in difficult/challenging situations can improve self-efficacy
- A person with low self-esteem can have high self-efficacy, and vice versa.
    - Ex. a perfectionist can have low self-esteem (critical about themselves) but high self-efficacy (still see themselves as capable of doing tasks). Competent at tasks with clear guidelines and lose confidence where there are no clear rules.
- **Locus of control** – the extent to which people perceive they have control over events in their lives.
    - **Internal** - when person believes he or she can influence events/outcomes. Events/Results come primarily from their own actions. [Ex. If someone w/ internal locus of control did bad on a test; they attribute outcome to not studying or if they did well based on their ability to study).
        - People w/ internal locus of control feel like they control their own destiny. Tend to be happier, less depressed, less stressed.
    - **External** – attribute events to environmental events/causes (If someone with external locus of control does bad on a test they attribute to hard test questions, and if they do well on a test they attribute it to the teacher being lenient/they were lucky).

Overview of Theories of Development

- The theories of changes that occur in a lifespan, and each stage builds up over another. Develop capacity through these stages. We pass stages in order.
- Freud – Proposed the **psychosexual theory** of development.
    - Believed early **childhood** was the most important age/period in which personality developed. Most of personality developed by age of 5. Early experiences play a large role in personality development. This development influences behavior later in life.
    - **5 stages** – if completed successfully, result is a healthy personality. If issues aren't resolved at a certain stage, then **fixation occurs.**
- Erikson – **Psychosocial development theory**.
    - Proposed personality/identity development occurs through one's entire **lifespan**.
    - Each stage depends on overcoming a **conflict,** and success/failure at each stage affects overall functioning of theory.

- **8 stages**
- Vygotsky – **Sociocultural Cognitive development theory**
  - Believed children learned **actively** through **hands-on** processes, and suggest parents/caregivers/cultural beliefs/language/attitudes are all responsible for development of higher function of learning.
  - Child internalizes information w/ interactions with others. This social-interaction is important development of cognition.
- Kohlberg – **Moral development theory**
  - Focussed on **moral reasoning** and difference between right and wrong.
  - Moral reasoning develops through level of cognitive development, and people pass through **3 stages** of development (each with 2 stages) **– 6 levels total**
    - Did research on groups of children and present children in moral dilemma situations and interview kids based on each of their conclusions in each dilemma.
- In general, Freud and Erikson were interested in how personality develops, and Vygotsky and Kohlberg were interested in how cognition develops

Freud's Psychosexual Development

- Proposed psychological development in childhood developed through these stages, and concept of tension and pleasure – the build-up of tension could cause a lot of conflicts.
- **Fixation** was due to concept of **libido** – a natural energy source that fuels mechanisms of mind. And when libido energy is fixated, can have lifelong effect well into adulthood. Libido is centered at different parts of the body at different times of development.
- First **5 years** of life are crucial in development of personality.
- Mnemonic – OLD AGE PARROTS LOVE GRAPES or OLD AGE PENSIONERS LOVE GRAPES/GENITALS or ORANGANTANGES ALWAYS PLAY with LITTLE GORILLAS

    - Old = oral, age = anal, parrots = phallic, love = latent, grapes = genital
- Depending on what stage we're at, going to be different fixation of energy at certain body part.
    - For oral stage – focus is mouth. For anal stage, anus, phallic is genitals, latent is none, and genital stage is the genitals.
- **Oral stage** – age 0-1 yrs., libido/sense of interaction is centered around baby's mouth (rooting/sucking reflex), vital for sucking/eating. Infant derives pleasure via oral stimulation (tasting/sucking). Because infant completely dependent on parents/caretakers, baby also develops sense of trust and comfort.
    - If fixation here, issues with dependency or aggression. Also smoking or biting fingers/nails, suck their thumb, people who overeat.
- **Anal stage** – age 1-3, centered around anus, ex. toilet training. Leads to developing control/independence, encouraging child to feel positive outcomes and helps child feel capable and productive. Serve as basis for competent, productive, creative adults.
    - If fixation occurs, have problems with orderliness and messiness.
- **Phallic stage** – age 3-6, children discover difference between males and females. Oedipus complex and Electra complex at this stage. Oedipus complex also develops – boys view fathers as rivals for mother's affection. Describes feeling of wanting to possess the mother and replace the father. Electra complex (by Carl-Jung) is the equivalent for young girls to their fathers. Resoled through process of identification, where child starts to understand and develop similar characteristics as same-sex parent.
    - If fixation occurs, cause homosexuality/exhibitionism
- **Latent period** – no focus of libido. A period of exploration, libido present but directed into other areas such as intellectual pursuits and social interactions. Important in development of social and communication skills. Children concerned with peer relationships, hobbies, and other interests. Play is between same gender children.
    - Fixation doesn't develop into adult fixation.
- **Genital stage** – back on libido, because individual develops strong sexual interests. Before this stage, focus on individual needs. Now, focus on needs of others. No adult fixation – person is mentally healthy. Goal: establish balance between various life areas (well balanced, warm, caring)

Erikson's Psychosocial Development - (Note the acronyms are from psychfiles and are a stretch)

- Greatly influenced by Freud, but his theory was based on culture and society
- Another key difference between his and Freud's theory was he suggested there was plenty of room for growth throughout one's life (not just childhood).
- Assumed a **crisis** can occur at each stage of development, between needs of individual and society. Successful of 8 stages results in acquisition of basic virtues and healthy personality.
    - Virtues are characteristic strengths that can be used by ego to resolve future conflicts
    - Failure in certain stage results in reduced ability to move on to further stages or unhealthy personality/sense of self.
- ACRONYM: 1 is bun , 2 is shoe, 3 is tree, 4 is dinosaur, 5 is skydive, 6 is sticks, 7 is heaven, 8 is plate. https://www.youtube.com/watch?v=U2HRFhMFMlg
- **Stage 1** – 0-1 yrs., crisis is trust vs. mistrust. (ACRONYM: BUN IS RUSTed) If an infant's physical and emotional needs are not met, as an adult he or she may mistrust everyone.
    - Virtue is **hope**
    - And failing to acquire of virtue can lead to suspicion/fear/mistrust.
- **Stage 2** – 1-3 yrs., autonomy vs. shame/doubt. (ACRONYM: Shoe shaped Car driven by doubtful SHA[N]E). Around 18 months to 3 yrs. children develop independence by walking away from mother, what they eat, etc. Critical that parents allow children to do that.
    - Virtue achieved is **will** (independence).
    - Negative outcome: If child is overly criticized/controlled, feel inadequate and lack self-esteem, and have shame/doubt in abilities.
- **Stage 3** – 3-6 yrs., initiative vs. guilt. (ACRONYM: Tree with an INN in it and a [Q]uilt around it) Children feel more secure in their ability to lead others and play, so ask questions.

    - Virtue they reach is a sense of **purpose** in what they do and choices/decisions they make.
    - Negative outcome: If tendency to ask questions is controlled, develop guilt – as if they're annoying other people and act more as a follower. Inhibits their creativity, and outcome is inadequacy. Some guilt is necessary so child can have self-control.
- **Stage 4** – age 6-12. Where teachers take an important role in a child's life, and child works towards competence. Crisis is **industry vs. inferiority (**ACRONYM: Dinosaur with dust on him feeling inferior).
    - Virtue: Child will gain greater significance and greater self-esteem, and try to win approval from others. Competence. Will feel industrious,
    - Negative outcome: but if initiative is restricted child feels inferior (don't have competence). Some failure is necessary/ good though, so child has modesty.
- **Stage 5** – age 12-20, adolescence. Transition from childhood to adulthood, so one of most important crisis. Want to start feeling they belong in society – **identity vs. role confusion (**ACRONYM: Skydiver dents his head on the ground when falling and then has confusion). In this stage, the child has to learn rules he needs to occupy as an adult, so may re-examine identity to figure out who they are. Body image plays big role.
    - Virtue is **fidelity**, seeing oneself as unique.
    - Failure: Role-confusion (I don't know what I want to be when I grow up). Can cause rebellion/unhappiness.
- **Stage 6** – **intimacy vs. isolation.** (ACRONYM: : Sticks being intimate and one being isolated). Age 20-40. Try to find love and relationships.
    - Virtue: Completion leads to comfortable relationships, love.
    - Negative outcomes: avoiding intimacy can lead to isolation/loneliness/depression.
- **Stage 7** – age 40-65 (Middle adult-hood), established career, so settle down, make families the center of their lives, and sense of being part of bigger picture. **Generativity vs. stagnation** (ACRONYM: GENERator powering heaven, a STAG powering the generator for the NATIONS heaven).
    - Positive virtue: Adults feel like they give back through raising children/work/community activities/organizations, so develop sense of care for others.
    - Negative outcome: is they feel stagnate and unproductive.
- **Stage 8** – 65+, slowing in productivity. Crisis is **integrity vs. despair**. (ACRONYM: plate with inteGRIT and a pear). Stage where people contemplate on lives, reminisce. May feel guilty about past or unaccomplished, dissatisfied.
    - Virtue is wisdom -look back on life with sense of closure/completeness and accept death wthout fear
    - but if we feel unproductive leads to despair/dissatisfaction upon death.

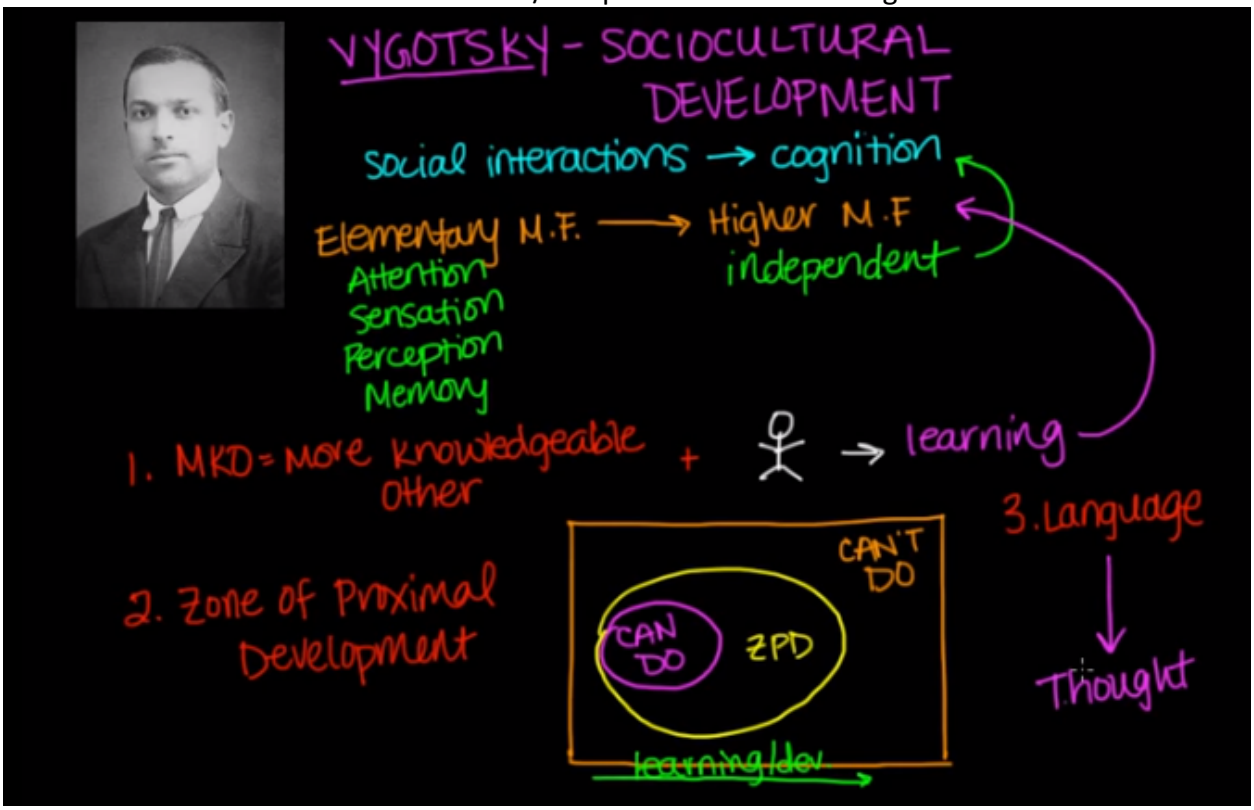
	AGE	CRISIS	VIRTUE	(-) OUTCOME
1	1yr	trust v. mistrust	hope	fear, suspicion
2	2yr	autonomy v. doubt	will	shame
3	3-5	initiative v. guilt	purpose	inadequacy
4	6-12	industry v. inferiority	competence	inferiority
5	12-18	identity v. role confusion	fidelity	rebellion
6	18-40	intimacy v. isolation	love	isolation, unhappy
7	40-65	generativity v. stagnation	care	unproductive
8	65+	integrity v. despair	wisdom	dissatisfaction

- Each of stages involve culture and society of which we develop in and occurs throughout life.

Vygotsky Sociocultural Development

- Studied the role social interaction plays in development of **cognition**.
- Focussed on **social interactions** between growing children and interactions with those around them in development of cognition-higher order learning.
- Passed away early (38 y/o), so much of his theory was left unfinished.
- Said babies have 4 *elementary mental functions:*
    - **Attention, sensation, perception, and memory** (acronym: elementary mental babies have crAMPS)
- These elementary mental functions are developed into more sophisticated and mental processes – **higher mental functions**. Most develop from skillful "tutor" – a model, ex. parent/teacher/someone older. Tutor = model, and child tries to understand instructions/actions provided by tutor and they internalize it.
    - *Higher Mental Functions:* **Independent** learning and thinking
    - Ex: solving a puzzle as a kid. You have a hard time as a kid, but a parent gives tips and strategies to solve the puzzle and the second time you can internalize these ideas and do it on your own.
    - Higher mental functions cultivated by tutor from who we model our behavior.
- Development to Higher Mental Functions (Cognition) from Elementary Mental Functions (Social Interactions):
    - 1. Requires cooperative and collaborative dialogue from a **MKO** (**more knowledgeable other**) – a person with a better understanding than the learner. The interaction with the learner + MKO → Learning + Higher M.F (Independence)
    - 2. **Zone of proximal development –** part where most sensitive instruction/guidance should be given. Ex. between ability of not being able to do

something and being able to do something. ZPD is the link between the zone of can't do and can do. Allows learner to use their skills they already have and expand learning to things they can't do.
    - Ex: Puzzle example: Not being able to solve puzzle to being able to solve puzzle. The guidance in this zone which allowed for the transition from a set of skills you already had to a more expanded skills through learning.
- 3. **Language** – the main means by which adults transmit info to children, and a powerful tool of intellectual adaptation. Ex. private/internal speech, when people speak out loud to themselves – happens most in children. Way for children to plan activities/strategies, and aids their development. Language is an accelerator to thinking and understanding.
    - Those children who engage in lots of private speech are more socially competent. Language develops from social interactions for communication purposes. Language leads to (→) thought (inner speech) - think for ourselves/independence of executing skills.



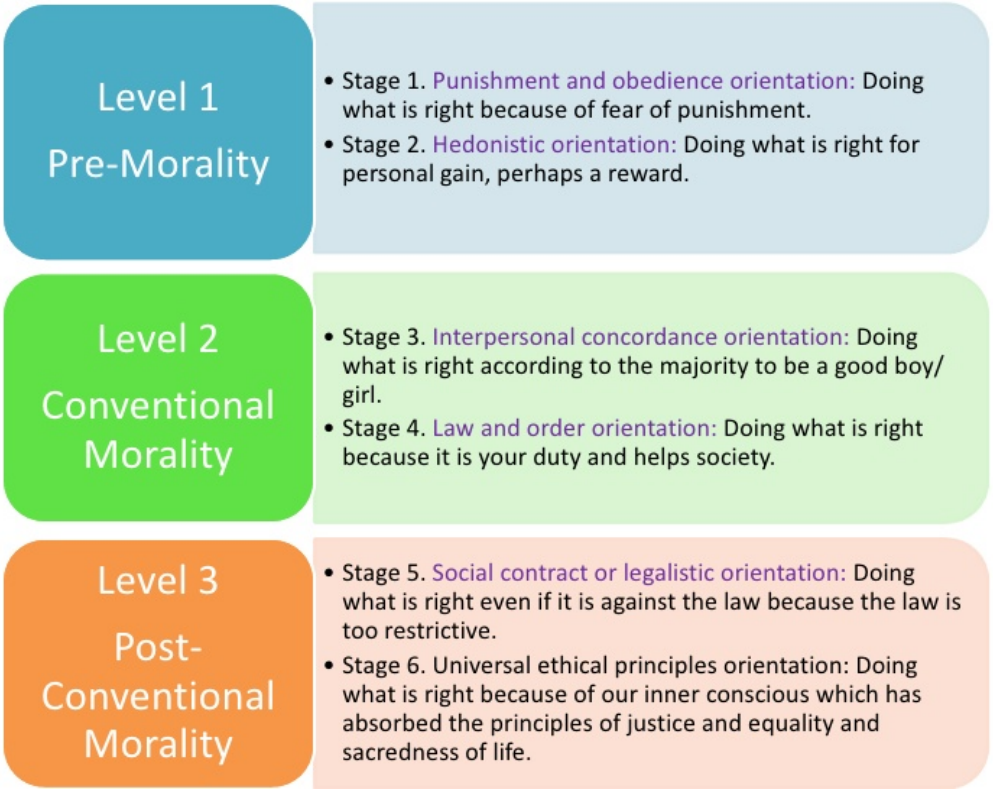
Kohlberg Moral Development

- Moral theory of development, different from previous 3, but based on **cognitive** development similar to Vygotsy. Looked at how people developed their morals, and the way moral reasoning changes as people grow (instead of emotional/physical development)

- Also looked at children (common). He told stories to children and gauged their response.
- Most famous story was the **Heinz Dilemma**, his wife was dying from cancer and drug was discovered made my local chemist that could save her. Chemist charged 10x the price it took to make the drug, and more than Heinz could afford. After asking family, he only had half the money, and explained to chemist his wife was dying and asked if he could have the drug for cheaper/pay the chemist at a later date. Chemist refused. Heinz, desperate to save his wife, then broke into chemist's office at night and stole the drug.
    - Asked children questions like what if Heinz didn't love his wife, if person dying was a stranger, should he have stolen it, and should police arrest chemist for murder if woman died.
    - After analyzing these, he came up with 3 moral stages, each split into 2 for a total of 6 stages.
- Three Levels of Moral Reasoning. Each have 2 sub-parts. Three level Acronym = (**PCP** Pre-conventional, Conventional, Post-Conventional).
- 1. **Pre-Conventional** (pre-adolescent) (ACRONYM: PREacher smacking oBEEdience with a Fish (self-interest)
    - 1. Obedience vs. Punishment – reasoning is based on physical consequences of actions, so obeying the rules is a means to avoid punishment.
        - Age: Children.
    - 2. Individualism and Exchange or SELF-Interest – recognize not just one right view by authorities, different individuals have different viewpoints. Doing what is right for personal gain.

  2. **Conventional** (ACRONYM: CONvict named Norm (Societal Norms – Good Girl/Bad Girl) behind bars (Law-and-order)
    - 3. Societal Norms /Acceptance- Good Boy and Good Girl - Authority is internalized, but not questioned, and reasoning is based on group person belongs. Individual is good in order to be seen as good by others, emphasis on conformity. "to gain acceptance and to avoid disapproval"
    - 4. Law and Order / Law abidance – maintaining social order, child is aware of wider roles of society and obeying laws. "to follow rules"
- 3. **Post-Conventional** (moral) (ACRONYM: POSTman delivering a contract (social contract) and Universal today (Universal principles). Higher moral reasoning.
    - 5. Social Contract – Individual becomes aware that even though rules and laws exist for greater good, there are times this law works against interest of particular people. Ex. for Heinz, is protection of life more important than breaking/stealing? People at this stage said yes. Sometimes law must be broken to reach these principles.
    - 6. Universal Ethical Principle – people develop own set of moral guidelines, which may or may not fit the law, and principles apply to everyone. People who uphold and believe in these have to be prepared to act towards these even if they have to obey consequences/disapproval/imprisonment. Very few people

who reach this stage, ex. Ghandi, Nelson Mandela, Martin Luther King. "to promote social welfare"


Level 1
Pre-Morality
• Stage 1. Punishment and obedience orientation: Doing what is right because of fear of punishment.
• Stage 2. Hedonistic orientation: Doing what is right for personal gain, perhaps a reward.
Level 2
Conventional Morality
• Stage 3. Interpersonal concordance orientation: Doing what is right according to the majority to be a good boy/ girl.
• Stage 4. Law and order orientation: Doing what is right because it is your duty and helps society.
Level 3
Post-Conventional Morality
• Stage 5. Social contract or legalistic orientation: Doing what is right even if it is against the law because the law is too restrictive.
• Stage 6. Universal ethical principles orientation: Doing what is right because of our inner conscious which has absorbed the principles of justice and equality and sacredness of life.

Level & Stage	Age Range	Examples
Preconventional **Stage 1: Avoidance of punishment** **Stage 2: Exchange of favors**	**Preschool – elementary; some junior high; few high school students**	**Stage 1: "I would cheat if I knew I wouldn't get caught."** **Stage 2: "I'll let you copy mine if you do my homework."**
Conventional **Stage 3: Good child** **Stage 4: Law and order**	**Few older elementary children, some junior high, many high school students** **(Stage 4 does not typically appear until high school)**	**Stage 3: "I'm not going to tell because I want her to like me."** **Stage 4: "You can't do that because the teacher said no."**
Postconventional **Stage 5: Social contract** **Stage 6: Universal ethical principle**	**Rarely seen before college (stage 6 is extremely rare)**	**Stage 5: "In this case, the rule may be wrong."** **Stage 6: "You shouldn't lie because it violates the Golden Rule."**

Social Influences [Branch of Social psychology]

- How imitation, roles, reference groups, and culture are all parts of social influence.
- Looks at individual thoughts, actions and feelings are influenced by social groups.

- **Imitation** – a type of individual social influence, one of most basic forms of social behavior. Begins with understanding there's difference between others and our self.
    - **Andrew Meltzoff** (1977) published study that questioned theory that understanding between self and others happens soon after birth. In his experiment *he suggested that babies are born with a built-in capacity to imitate others.*
    - In his experiment:
        - A baby 12-21 days old, baby copies sticking tongue out. Baby imitating experimenter.
        - Was it true imitation or something else? Picture you opening mouth, baby should also open mouth. Had to ensure it wasn't a reflex or conditioning either. When baby had pacified in mouth, and experimental stuck out tongue, baby imitated them after the pacifier was taken out.
        - Condition: Experiments facial expressions had to be blank during this experiment.
        - Suggests we are born with built-in capacity to imitate others. Built in social mechanism which is critical for our species to learn through others.
        - Evidence suggests we have **mirror neurons**, when one fires another fires when we observe same action performed by other person. (Found in areas of brain that are motor (parietal lobe), premotor cortex (frontal lobe), and somatosensory cortex (parietal lobe). Can be helpful in understanding Imitation further.
- **Roles** – we have many different roles that define what we do and who we are. We adopt Social norms - the accepted standards of behavior of a social group, use it to guide our behaviours (what behavior is appropriate). Norms provide order in society and we use them to conform to expectations of that role/expectations of others. We respond to their approval when we play our roles well, and we get disapproval when we play roles badly. Expect people to behave in way that fits that role, and have them fit the role even more when roles are stereotyped.
    - Ex. Stanford Prison experiment - being in a prison environment caused guards to be more authoritative, sadistic, and power to do what they wanted with the prisoners.
        - Prisoners: felt they were powerless to the guards. They would suck up to the guards. These were expectations of the prisoners for approval by the guards.
        - Prison environment created these characteristics. The guards before the study did not have these characteristics.
- **Reference groups** – the group to which people refer in evaluating themselves. People's beliefs, attitudes, behaviours. Constantly looking for external groups that align with our beliefs/attitudes/behaviours. These groups influences our social decisions - our own beliefs, attitudes and behaviors. Reference groups are groups that people refer to when evaluating their [own] qualities, circumstances, attitudes, values and behaviors. "any

group that individuals use as a standard for evaluating themselves and their own behavior"

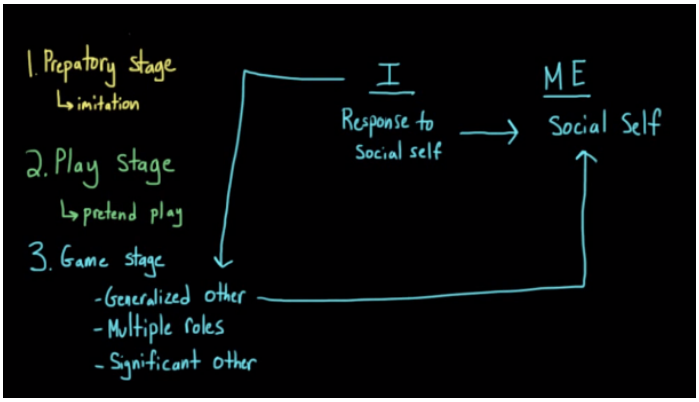
- **"group that an individual compares himself or hearlself to for self-**evaluation"
- Ex; Refer to a social-science student reference group when deciding what political party to vote for in an election. Or referring to feminist reference group when deciding whether to change name after marriage if we are female.
- Any person or group in formation of general/specific values influences are social decisions. You bring subconsciously beliefs of the group everywhere, and you wish to satisfy the expectations of others. These reference groups set some level of *aspiration*.

- **Culture and socialization** – important contributions of society to our personal development, emphasises interaction between the people and culture in which we live. Everyone around us (teachers, coworkers) influence our social-identity development and on a larger scale the country which we live, communities, language, attitudes of groups we belong too.

George Herbert Mead: The I and the Me

- **Charles Cooley** and **George Herbert Mead** both thought others could play a significant role in how we view ourselves, however, they differed in how they thought this would happen.
  - Cooley thought everyone a person interacts with in a lifetime influences their identity, Mead thought this was more restricted – only certain people can and only in certain periods of life. Mead also thought that the way others influence us changes across the lifespan.
    - In short: Cooley had a broader definition than Mead
- **Mead** developed the idea of **social behaviourism**, the mind and self-emerge through the process of communicating with others (beginning of symbolic interactionism).
  - Infants + children were not influenced by others in any way, merely imitate others, and see themselves as being the focus of their own world and don't care what others think of them. Lack ability to take perspective of another person – related to **Piaget's** concept of egocentrism.
  - As we grow up, our belief on how others perceive us is more important, this happens through 3 stages: *preparatory, play stage, and game stage.* These occur overtime as a child grows.
  - 1. **Preparatory stage** –interaction through imitation, ex. play with pots and pans when parents are cooking. As they grow older, focus more on communication with others instead of simple imitation, and get practice using symbols (gestures/words). *Can't take perspective of others.*
  - 2. **Play stage** – more aware of social relationships, reflected in children's tendency to *pretend play as others* like firefighters, doctors, etc. Mentally assuming perspective of others and acting based on their perceived point of

view. Focused on role-taking: mentally taking perspective of another person and acting on that perceived viewpoint.
    - Way beyond immigration. They create social-interactions (not just mimicking)
    - Children consider attitudes, belief, and behaviors of individuals closest to them.
- 3. **Game stage** – Start to understand attitudes/beliefs/behavior of "**generalized other**" (society as a whole). With this comes whole new understanding of society. Children start to realize that people perform in ways not only on what they personally believe but what also in the ways society more broadly expects of them and they understand that people can take on multiple roles (people can be more than just moms, doctors, or teachers – they can be multiple things @ once). Also realize others have opinions about them and those perceptions others have are based on how they act and what they say. They begin to be influenced by these perceptions and are concerned by reactions of others to what they do. But don't care about reactions of everyone, only significant others (people with important relationships to individual, ex. parents/teachers/close peers).
- Believe this last stage led to development of the **"I"** and **"me".**
    - **Me** = what we learn through interactions with others. How individual believes the generalized other perceives us, the **social self**, and learned through interactions with others. Socialized and conforming aspect of self.
        - Way to remember: The "Me", The conforming, socialized person, who tries to not do any dick moves. "Societies View"
        - Ex: me thinks about people go from high school to college in US
    - **I** = the response of the individual to the "me". I thinks about what those things mean. aka attitudes of others. The spontaneous, less socialized component of the Self.
        - Way to remember: The "I", the nonconforming, the non-socialized person, the one who make dick moves all the time. "individual identity (personal response to what society thinks")
        - Ex. I = is it best for me to go to college from HS, or work first or travel for a few years.
    - Our **actual self** is the *balance between the I and the me.*
    - Me = society's view (that's me!), the part of self-formed in interaction with others and social environment, and I = individual identity stepping in and our personal responses to what society thinks. The "I" is the spontaneous and autonomous part of our unified self.



Charles Cooley – Looking Glass Self

- **Socialization** describes the process by which people learn the attitudes, behaviours, and values expected by their culture/community. Socialization learning occurs through observation of/interaction with people who we are surrounded by – those close to us and everyone else (ex. parents, peers, person at supermarket, celebrity, etc.)
    - Everyone has something to teach us on how we should act in our community.
- Socialization also shapes our **self-image and self-concept**, and Charles Cooley used the term "**looking glass self"** to describe this process – idea that a person's sense of self develops from interpersonal interactions with others.
- Thought this happened in 3 steps
    - 1) How do I appear to others?
    - 2) What must others think of me? (are we: shy, intelligent, funny, or awkward)
    - 3) Revise how we think about ourselves (based on correct OR incorrect perceptions on others evaluations).
- *Critical aspect of this theory* is Cooley believed we are not actually being influenced by opinions of others, but what we **imagine** the opinions of other people to be.
    - Ex. Say we have teacher grading paper harshly, and doing it because they think that student has a lot of potential. But student gets paper back, think the teacher did so because student is not very intelligent, and came to conclusion they're not very good at literary analysis. Might result in student putting less effort into the class. Student is acting on incorrect perception on what teacher believes. Since attitude influences behaviors, we can put less effort into this class instead of more.
    - But can also be influenced by future interactions – student might talk to teacher, and student was able to revise their incorrect perceptions and develop a different self- perspective.
- A good example of the looking glass self is a person trying on clothes before going out with friends. Some people may not think much about how others will think about their clothing choices, but others can spend quite a bit of time considering what they are going to wear. While they are deciding, the dialogue taking place inside their mind is usually a dialogue between their "self" (that portion of their identity that calls itself "I")

and that person's internalized understanding of their friends and society (a "generalized other"). An indicator of mature socialization is when an individual quite accurately predicts how other people think about him or her. Such an individual has incorporated the "social" into the "self. "

- The looking-glass self suggests that the self-concept is influenced by how we perceive that others are viewing us. Based on the looking-glass self, a person who acquires a stigmatized illness is likely to internalize the stigmatization directed against him or her.
    - "Symbolic interactionist paradigm in sociology. The looking glass self suggests that the self-concept is more than the product of self-reflection. Instead, the way in which people see themselves is based on how they believe others perceive them during social interactions"
    - The looking-glass self is the notion that we construct our identity out of our interpersonal interactions and the perceptions of others. This is not something that one can necessarily avoid – it is simply one sociological construct for understanding how we build our sense of self.

Perception, Prejudice, and Bias

Attribution Theory – Basic Co-variation

- **Attribution theory** – how we explain behaviours of others around us.
    - Explain the behavior of other people by breaking down our understanding/explanation of their behaviours to factors about them, and factors related to their environment/surroundings.
    - **Internal (dispositional attribution)** – about them
    - **External (situational attribution)** – environment
    - Behavior of others often have a *combination* of internal and external factors.
    - Attribution theory relates to the ways in which people attempt to explain various behaviors and events.
    - Fundamental attribution error occurs when a person assigns too much weight to internal causes rather than external factors when looking for causes of another person's behavior.
- **Co-variation model** – 3 cues of Kelley's co-variation model: *consistency (time), distinctiveness (situation), consensus (people)*
    - Ex. Take flaky friend, friend forever cancels on us. Consistent behavior over time. High level of consistent behavior over time, we are more likely related to them as a person as opposed to the world working against them in this situation.
        - When **consistency** is high = attribution to *internal factors*
    - Ex. Very nice friend Jim, but one day he gets so mad at the pizza place. Out of character and distinctive. So much more likely to be related to the environment. **Distinctiveness** = *situational.*

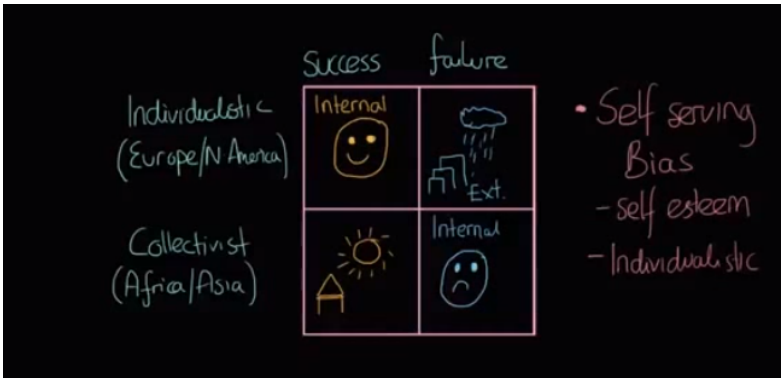
        - Distinctiveness of a situation = attribution to *external factors*
    - Third factor in co-variation model – *"group lateness*" – if you arrive late at meeting but if you are with 20 other people are late too, high degree of **consensus**. When a lot of people demonstrate same behavior, we are more likely to attribute behavior to situational cause.
        - Consensus of people = *attribution of external factors*

Attribution Theory – Attribution Error and Culture

- How do we understand behavior? We look at behaviour as coming from two parts – a person's *internal attributes*, and secondly as being fuelled by *situation/external factors* (ex. Weather, housing, finances)
    - If in middle, we are a **neutral judge** and see a combination as both.
    - Behaviors are often complex and involve a combination of internal and external factors.
- But often when we look at behaviour of others, we are NOT neutral, we're more likely to attribute their behaviour to their **internal factors** instead of considering complex external factors.
    - We term this the **fundamental attribution error –** over attribution of others behavior to internal causes. Problematic when looking at complex patients (ex. Obese patients who can't exercise because they are struggling with poverty) – we under-recognize the situational and social problems, and healthcare barriers they can have, blaming them for their own problems.
- When we consider our own behaviours, we are more likely to blame our behaviour on **external factors** (ego-preservation). We consider ourselves victims of circumstance. No name for this attribution error.
- **Bias** - Cognitive bias is the tendency to think in certain ways. Cognitive biases often cause deviations from a standard of rationality or good judgment.
- **Actor-Observer Bias:** we are victims of, but others are wilful actors. (same thing as saying: circumstance (we attribute out personal behavior but others behavior on internal factors)
- There's also a **cultural** component: the fundamental attribution error occurs more in individualistic societies who place an emphasis on individual achievement (NA and Europe – cultures).
    - Cultures have different ways they explain success and failure
    - In **individualistic** cultures (Western – Europe/America), success is over-attributed to internal and failure is over-attributed to external/situational factors.
    - In **collectivist** cultures (Eastern – Africa/Asia), success is attributed to external and failure to internal factors
- **Self-serving bias**: mechanism of preserving our self-esteem, more common in individualistic cultures. If we succeed it's due to our internal/personal qualities, but if we fail no hit on self-esteem because likely to do with things outside of our control.

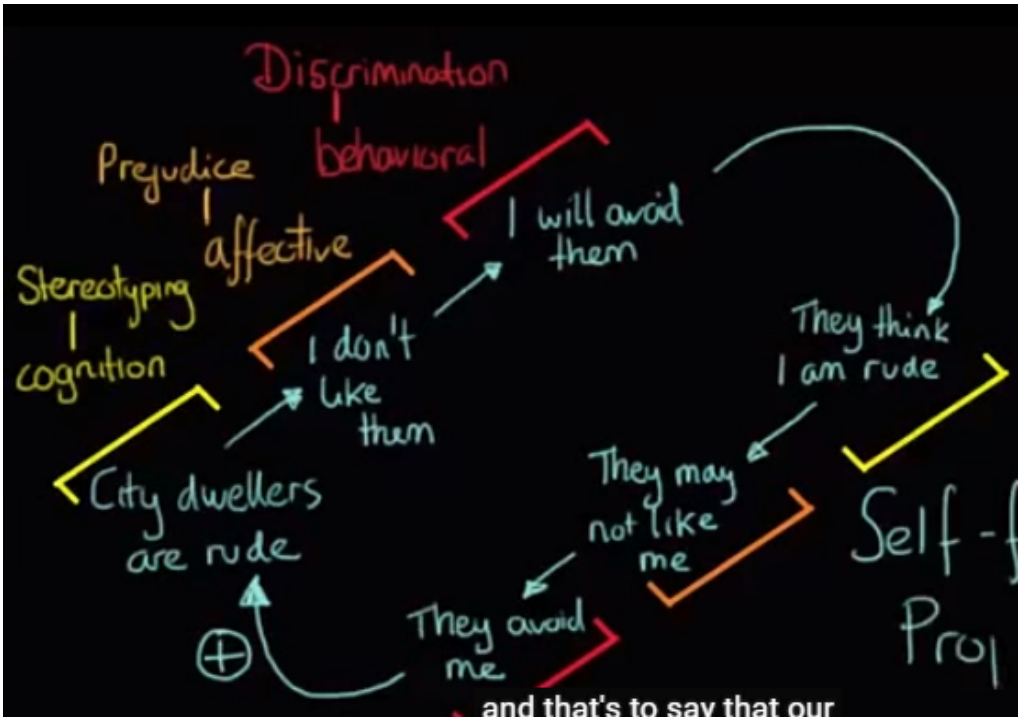
- Individualistic societies tend to demonstrate a great degree of self-serving bias. More important in individual societies because of their emphasis on achievements and success.

- **Optimism bias** is belief bad things happen to others, but not to us.



Stereotypes: Stereotype Threat and Self-fulfilling Prophecies

- **Stereotyping** is *attributing a certain thought/cognition* to a group of individuals, and **overgeneralizing**.
  - Examples: People who wear glasses are smarter, people who live in cities are abrasive,
  - Can involve race, gender, culture, religion, shoe size.
  - Disadvantages: it's inaccurate
  - Advantages: allows us to rapidly assess large amounts of social data
- **Stereotype threat** – (negative consequence of stereotyping) - self-fulfilling fear that one will be evaluated based on a negative stereotype.
  - Ex. Blue and red students, both perform equally. Next time, implement negative stereotype about blue students, blue students perform worse.
  - What **stereotype threat** is – exposure to a negative stereotype surrounding a task can actually cause decrease in the performance of an individual performing task. Stereotype threatens performance.



- **Self-fulfilling prophecy** – stereotypes can lead to behaviours that affirm the original stereotypes.
    - "City dwellers are rude" (**cognition**, **stereotyping**) -> I don't like them (**affective** component, **prejudice**) -> I will avoid them (**behavioural** component, **discrimination**)
    - They think I'm rude (cognition) -> They may not like me (affective)-> They avoid me (behavioural) -> City dwellers are rude
        - Continuous circle that positive feedbacks on itself.
        - The city dwellers become ruder over time in response to our own behavior towards them.

Emotion and Cognition in Prejudice

- **Prejudice** is made up of 3 components:
    - 1. Component#1: **Cognition (*Stereotype*)-** Fundamental underlying thought, overgeneralized belief (cognition)
    - 2. Component#2: **Affect** – **prejudice** carries an emotional component
    - Component #3: **Discrimination** *(tendency for Prejudice to lead to **behavior**)* **-** capacity to carry out a behavior and act on prejudice **(ABC model)**
- At the core of prejudice is often fear of frustration. **Scapegoats** are group of people towards whom the aggression is directed, ex. Jews during World War II.
- There are types of personality more subject to prejudice:
    - One example (Which is controversial): the **authoritarian personality –** who are very prejudice: They're **obedient to superiors**, but don't have much sympathy

for those they deem inferior to themselves – they are **oppressive**. And rigid thinkers, **inflexible** with their viewpoints.
        - These people probably had a harsh bringing/lots of discipline growing up
        - They use prejudice to **protect their ego** and **avoid confronting** aspects of themselves because they're always focussed on others.
    - Personality types are hard to change.
        - So intervention to reduce prejudice by targeting these authoritarian personality types is difficult
- **Frustration Aggression Hypothesis –** not personality based, but more emotional.
    - Ex. Someone getting **frustrated** can lead to prejudice. When someone's frustrated, frustrations turn to aggressive impulses, and direct that towards the employer. But you may lose your job, so you keep bottling up the aggression – and rechanneled it somewhere else. Often towards **minorities**.
    - Display aggression towards other people – **scapegoating**. Often seen in times of economic hardship.
- **Hypothesis of Relative Deprivation** –upsurge in prejudice/discrimination when people are deprived of something they feel entitled to
    - Relative depreciation is the discrepancy of what they are entitled to and what they get)
        - Extent and how quickly this happens can lead to collective unrest – an upsurge in prejudice and discrimination.
        - Linked to Frustration Aggression Hypothesis

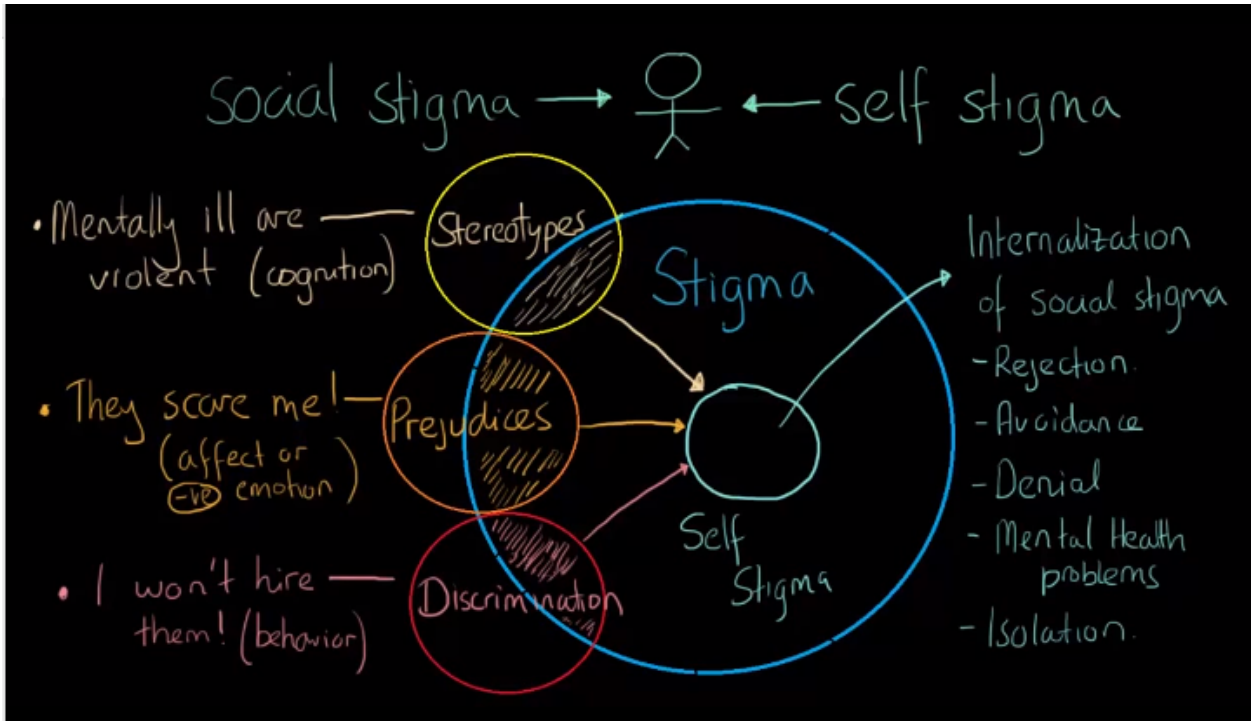
Prejudice and Discrimination Based on Race, Ethnicity, Power, Social Class, and Prestige

- Prejudice and discrimination usually talked about in relation to racial and ethnic groups.
    - Physical characteristics with social significance – some have more meanings than others. Ex. skin color, but not eye color. Attached meaning to skin color.
    - Ethnicity – Defined by national origin/distinct cultural patterns. ex. Puerto Rican, Irish, Japanese. Also include groups like Jews defined more by cultural practices than country of origin.
- Can also be based on power, social class, or prestige.
    - **Power** – political power, economic (unfair hiring policies to minorities), personal (laws can limit where someone lives/etc.)
    - **Social Class** – *status (social status) is relative* (to have higher status you need a lower status). Social class often sets stage for prejudice (people on top maintain differences between themselves and lower class – the ***Just World Phenomenon*** – good things happen to good people and bad things happen to bad people, contributes to prejudice).
        - Ex. Of just world phenomena thinking: High social class people say they are there because they work harder and low social class people are there because they don't work hard.

- **Prestige** – often based on occupation (ex. Being a doctor, lawyer). Minority group members have lower paid jobs typically (ex. Janitor).

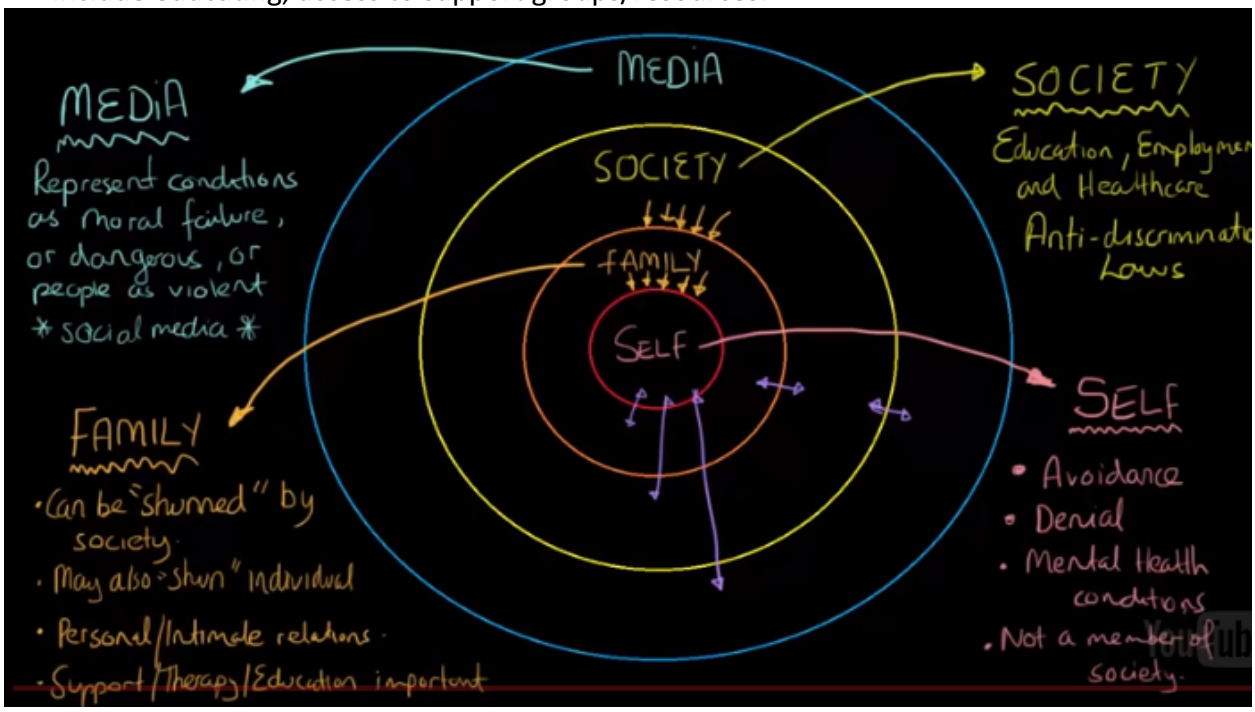
Stigma – Social and Self

- A stigma is extreme disapproval of a person based on some behavior or quality of that person. Typically, a culture (or sub-culture) will stigmatize a person based on overt physical deformations (physical disability), deviant personal traits (drug addiction), or deviation from accepted norms of the ethnic group (being a "loose" woman in a traditional Latino subculture).
- **Social Sigma** - Extreme disapproval/discrediting of individual by society – comes in 2 forms: 1. **social stigma** and 2. **self-stigma**
- 1. Social Stigma:
    - Social stigma can be fuelled or associated with several other key concepts: **stereotypes, prejudices, discrimination**. Relationship/overlap between stigma and these is unclear and is variable depending on source.
        - Derived from symbolic interactionist perspective.
        - Calls attention to how certain individuals or groups face social disapproval. Often, the social disapproval is associated with a behavior, identity, or other attribute that is considered deviant by others"
        - Associated with an attribute that is devalued
        -
    - Social stigma against mental health is big problem – ex. stereotype is mentally ill are violent (cognition), I become scared of mentally ill (affect, prejudice), so may not want to live with them or hire them (behavior, discrimination)
    - Social-stigma and components can vary a great deal by sociopolitical context (sexual orientation for example).
- Self-Stigma:
    - Self-stigma is when individual can internalize all the negative stereotypes, prejudices, and discriminatory experiences they've had, and may begin to feel rejected by society, avoid interacting with society.
    - Ex. someone who has HIV/AIDS and feels the social-stigma may go into denial that they have the condition, experiences hits from self-esteem and suffer from depression (negative mental health), and display behaviours that isolate themselves from society and stop them from taking part in vocation/education/other social activities for example (further isolating them).



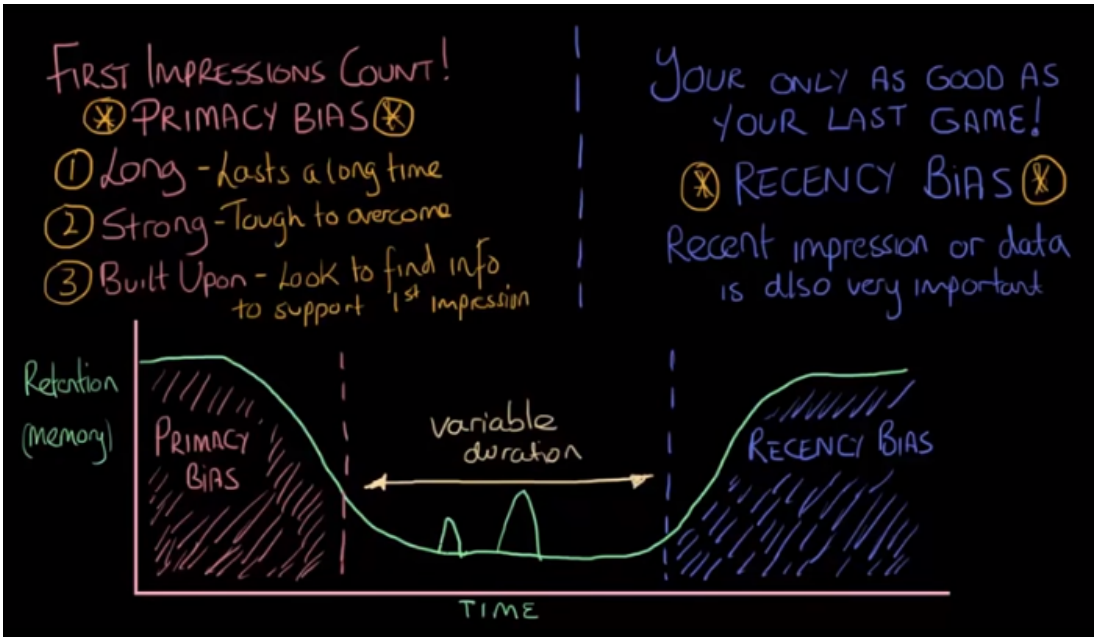
- Stigma can be studied by concentric circles.
    - Let's imagine four circles from deep to superficial*: First circle = self* (individual who is stigmatized), *second = family (close social group), third = wider society, fourth = media (important external society).*
    - Bidirectional relationships between all these groups.
    - **Media:** outer circle**.** Major source of stigma, because can depict conditions as being dangerous, violent, moral-failings (ex. This occurs in media representation of mental illness) etc. Also creates stigma against: HIV/AIDS, Obesity, substance use problems.
        - *Social media* is also huge component in creating stigma.
        - We need to have guidelines for journalists to reduce the stigma in society.
    - **Society** – interactions between self and society like education/employment/health care and stigmatizing views can affect individual to get a job (earning an income), in healthcare (to get appropriate level of healthcare, follow-up care, getting a screening), etc. A great intervention to stop societal level stigma is the use of **legislation and anti-discrimination laws.**
    - **Family** – family can be shunned by society (if they have a family member with stigmatizing condition), or family might shun individual themselves. Ex. isolate the individual who is stigmatized against in the family and keep isolate/as secret within family. May be detrimental to personal/intimate relationships, and *interventions like education/therapy are important.*

- **Self** – core circle – media, society, family interactions can be internalized by an individual and can lead to avoidance, denial of condition, suffering of mental health conditions, and no longer participating in society. Useful interventions include educating, access to support groups/resources.



Social Perception – Primacy and Recency Bias

- *First impressions count!* They're 1) **long** (lasts a long time) 2) **strong** (tough to overcome) and 3) **easily built upon** (people put extra emphasis on info that helps reinforce first impression, and not info that doesn't….ex. you are a messy person, people will look at your messy room instead of your tidy desk).
    - Called the **primacy bias**: first impression is more important than later data.
- Your most recent actions are also very important, and people place a lot of emphasis on your recent actions/recent performances, more than ones before – the **recency bias**.
    - Ex: you're only as good as your last game, last match.
- Information retention (memory) relates to primacy and recency bias.
    - Primacy and recency events are more important to developing memory.
    - In Variable duration (in between primacy/recency – you might remember some actions a bit more if an action is unusual or elicits an unusual response in you.


First Impressions Count!
Primacy Bias
1 Long - Lasts a long time
2 Strong - Tough to overcome
3 Built Upon - Look to find info to support 1st impression
Your only as good as your last game!
Recency Bias
Recent impression or data is also very important
Retention (memory)
Primacy Bias
variable duration
Recency Bias
Time

Social Perception – The Halo Effect

- The **halo effect** is tendency people have inherently good/bad natures, rather than looking at individual characteristics. Ex. the **physical attractiveness stereotype** – believe attractive people have more positive personality traits.
- Ex. Jim, our initial overall impression is in the middle. His accounting rating/skills is very high, sales are negative, and leadership is moderately good.
    - **Halo effect** – as if someone has a halo over their head. If we have an overall positive first impression, we start to analyze all their skills based on our overall first impression rather than just skills. They get an overall boost in each of their skills because of our impression.
        - Ex: Now imagine, he has overall very good impression, even though he has the same actual skillset. We would *perceive* that the person is much better at other skills not demonstrated. Regardless of evidence, We may perceive he's actually pretty good at sales instead of below average, We may say he is extra-ordinary in leadership and accounting instead of just good.
    - Halo effect often happens with celebrities, and greater attractiveness.
        - Ex; we think attractive people are kind, good leaders, hospitable without actual evidence.
- Now imagine someone who we think is overall very poor. Even if baseline skills are same, we perceive them to all be lower – the **devil effect/reverse halo effect**. Can carry over into how we see other attributes about the person. Happens if overall negative impression or if one attribute is very negative.
    - Ex: From being good at accounting we can perceive them as being mediocre, we can perceive someone as being awful at sales (even though they are great). We

can see them as having terrible leadership (instead of being moderately good). The reduction of our perception depends on the situation.

- Ex: Halo effect: Teacher sees kid who is good can't do no wrong. Reverse-halo/devil effect: Kid who is wrong that can do no right

Social Perception – The Just World Hypothesis

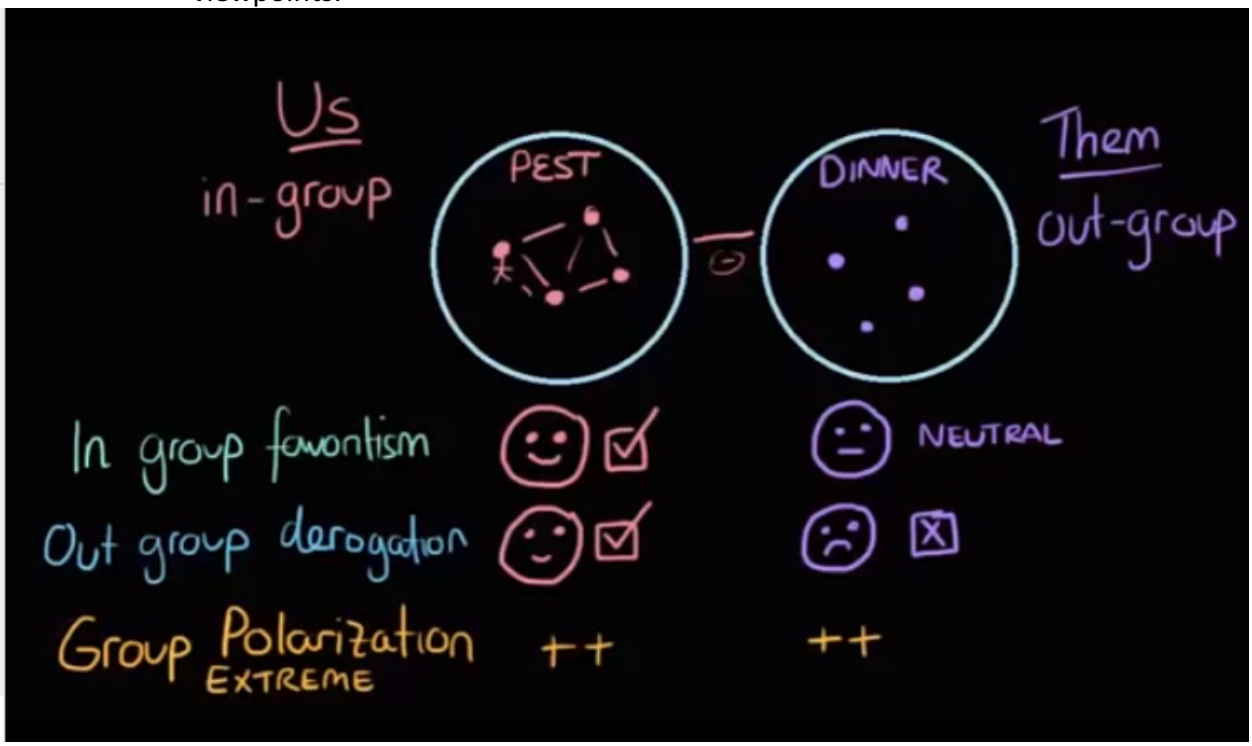
- "You got what you deserve". "you got what was coming to you".
- The **"Just World Hypothesis**" - Predictable result as a consequence for our actions. Noble actions performed/good deeds by an individual are rewarded, while evil acts/deeds are always punished.
    - Ex: our college Tom does a *noble-act* (helps an old lady cross the road. We would expect a predictable appropriate consequence such as a *reward.*
    - Ex: Tom performs an evil act, he gets punished.
    - Suggests there is some kind of special force, "cosmic justice" at play.
    - Reason people think in this way because it *helps individuals rationalize their or others good*/fortune or *misfortune*. Also allows people to feel like they can influence their world – easier to engage in goal oriented behavior and plan for the future. Ex. if I go to school I will be rewarded in life. If I work hard, I will get what I want. If I do the right thing, I will get rewarded.
    - However, just-world doesn't always hold true – people are not always rewarded for their actions and punished for their evil deeds. Ex. Using this just-world hypothesis we may blame people in poverty for being poor because they deserve it. Or victims of domestic violence for being victims because they deserved it.
- When the "*just world hypothesis*" is *threatened* (which occurs on a daily basis, we say "the world is not fair"….we see evil deeds being rewarded and good deeds being punished), we need to mentally make sense of them to keep just world hypothesis in tact– we use **rational techniques or irrational techniques**
    - **Rational Techniques:**
        - 1. <u>Accept reality</u>
        - 2. <u>Prevent or correct injustice</u> – with charities, sign a petition or changes to legal system
    - **Irrational techniques** can also be used
        - 1. <u>Denial of the situation</u> – refuse to accept the situation
        - 2. <u>Reinterpreting the events</u> – change our interpretation of the *outcome*, the *cause*, and the character of the victim.
            - Ex. If a Victim of violence that was hurt, they were really hurt, we can reinterpret outcome(wasn't that bad, it was a trip, it could have happened to anyone), reinterpret cause (victim was working in a bad neighborhood), or reinterpret character of victim(I always thought she was a good human being but I now realize she probably isn't, she was hanging around with the wrong people, etc.)

- **Attribution Theory** - how do we explain the behavior of other people?
    - Split up into internal causes and external causes.
    - JWH overemphasizes/attribute people's actions to personal/dispositional/internal factors and underemphasise situational factors that are at play.
        - Ex; poor person = personal miss-failings instead of recognizing the complex situational/environmental causes.

Ethnocentrism and Cultural Relativism In-Group and Out-Group

- **Ethnography**: Study of particular people and places. It is a more of an approach than a single research method in that it generally combines several research methods including interviews, observation, and physical trace measures. Good ethnography truly captures a sense of the place and peoples studied.
- **Ethnocentric: j**udging someone else's culture from the position of your own culture
    - Viewing our own culture to be superior to that of others
    - Can lead to cultural bias and prejudice
    - Using one's own cultural standards, such as norms and values, to make judgements about another culture.
- **Cultural relativism: t**he practice of assessing a culture by its own standards rather than viewing it through the lens of one's own culture. Judge and understand another culture from within their culture –
    - No absolute right or wrong, but we have different cultures which are themselves valid.
    - *Important to consider:* Can falter if someone uses it to conduct activities that violate rights of humans no matter what culture they're from.
    - *"Refers to an awareness of differences across cultures in norms, values, and other elements of culture"*
- **Xenocentrism**: judging another culture as superior to one's own culture
- **Cultural imperialism:** the deliberate imposition of one's own cultural values on another culture.
- People within groups share psychological connection between peers, related to politics/culture/spirituality.
    - **"In" group** – the one we are connected with. "US". Stronger interactions with those in the in-group than those in the out-group. Interactions are more common and more influential as well within In-group.
    - **"Out" group –** "THEM". Group we're not associated with, "group of people who we do not feel connected too"
    - **In-Group favouritism** – we favour/friendly to people in our own group, but those in out-group we are neutral – we don't give them favours we do to our in-group.
    - **Out-group derogation** – we are super friendly to our in group, but not friendly to out group – we discriminate. Happens if we feel that the out group is threatening to or undermine in group's success.

- **Group polarization** – Group makes decisions that are more *extreme* than any individual member in the group would want. This can turbo charge the group's viewpoints.



Attributing Behaviors to persons or situations

xSelf Esteem, Self Efficacy, and Locus of Control

See notes above

xSelf Concept, Self Identity, and Social Identity

See notes above

xSocial Influences

See notes above

xLocus of Control, Learned Helplessness, and the Tyranny of Choice

See notes above

Social Behavior

Proximity and the Mere Exposure Effect

- **Geographical proximity** /nearness is most powerful predictor of friendships and relationships.
    - People date, like, marry people of the same neighborhood or those that sit next to in class or work in the same office.
    - Mating starts with a meeting – Why is proximity so powerful for relationship formation? 1. We aren't going to fall in love with someone we don't meet. You can't start a relationship/befriend those who live far away. Even with social media, and easy travel/connection with individuals far away – rule of proximity is still true (even if you take internet dating into account).
- **Mere exposure effect** = repeated exposure to novel people or objects increases our liking for them. More often we see something, more often we like it. Applies to everything – music, nonsense syllabus, numbers, objects, etc.
    - There are exceptions, but in general true. Especially with attraction.
        - Exceptions: you start hating orange juice, start to despise song you hear over and over on the radio. This is called "burn out" but most things do not violate the mere-exposure
    - Ex. Study 1: focus on attraction. Researchers had undergrads rate attractiveness where males rated women's attractiveness, then took 2 women rated similarly and placed them in same class as the male rater. After 5,10, or 15 classes males rated the woman who was with them in 15 classes higher than those women who they attended classes with 5-10 times – even though they rated the two the same initially before the repeated exposures.
        - Whom we say day to day are more attractive and likeable.
    - Ex. Study 2. study with individuals who had **anterograde amnesia** (retrograde amnesia is loss of all memory before an accident that causes amnesia, anterograde amnesia individuals can recall memory that was formed before an incident but cannot form new memory after accident). Showed them faces, and then showed them faces again at later date, with some new faces along with some old. Ask individual if they've seen before, say no. But if ask which one attractive, they still pick the face they've seen before
    - Even if they are incapable of forming the memory they have seen a person before, they still consider them more attractive. *Shows us how subtle this mere exposure effect is.*
    - **Advertisers** know this effect. They depend on the mere exposure effect to sell you different products. More times we see a brand more likely we are to form a positive opinion about it.

Physical Attraction

- What does physical attraction mean, and are there things attractive to all people?
- There are cultural differences, but some things are **universally attractive** – attractive across cultural backgrounds. Things like youthfulness, skin clarity/smoothness, body symmetry. For women, low waist-hip ratio and full breasts. For men, muscular chest and V-shaped torso (broad shoulders, narrow waste).
- **Facial attraction** is more important than body attraction. For women, high forehead/small chin and nose/full lips/high cheekbone are attractive. For men, strong chin, jaw, cheekbones, and long lower face.
    - Both men and women are attracted to high level sexual dimorphism – the degree of difference between male and female anatomical traits. [We are attracted to strong facial features of opposite gender]
    - *Also* **averageness is attractive** – turns out unique traits are not most attractive. Attractiveness is related to averageness. Most respondents pick 32 face average "face morph (faces digitized and averaged)" as most attractive, and 2 face average less.
        - Even if you average 32 different faces, still looks the same as the average of 32 other faces. Suggests there's some prototype. (there is facial averageness).
- Subtler things also influence attractiveness – ex. red background more attractive than white background.
- Unrelated physiological arousal also influences attraction – individuals who just walked across narrow bridge (sympathetic arousal) leads to increased rating of woman. Because during attraction sympathetic arousal occurs as well, ex. fast heartbeat. (you rate a woman while crossing a bridge higher because you are experiencing sympathetic arousal as when compared to rating the same woman while walking across the street.)
    - When you are physically attracted to someone you experience this fast heartbeat (sympathetic arousal too).
    - Our brain recognizes the sympathetic arousal from high height and being attracted together.
    - For someone to be attracted to you – take them on a date to the amusement park.

Similarity

- How similar someone is to us is huge predictor of attraction.
- Close friends and couples are more likely to share common attitudes, beliefs, interests, and values. We tend to partner up with people who match our age, race, religion, and economic status/educational level. We like people who are like ourselves in looks.
    - Demonstrated through experimentation and correlation/surveys.
    - One study, two people brought in the lab and they were told they were going to be playing a game. One person was a confederate (in on the study the entire time). Participants were split into 2 conditions. 1. Participants saw a picture of

the other player and in 2. Picture shown of other participant w/ some of their own facial features mapped onto it. Results show that the individual was more likely to cooperate with the other player when the other player has similar facial feature as to his own.
        - Person is more likely to trust/cooperate with the person who had similar characteristics (of the photo of someone whose facial features are morphed with their own).
    - Also more likely to think individual is attractive when their facial features are morphed with their own.
    - More likely to vote for political candidates whose photographs have been changed to include our facial feature.
    - *We like people like us (same interests/attitudes) as well people like us who are similar to us on any level (like sharing same physical features).*
- Similarity can help people stay together. Does it help them stay together? Research has shown yes.
    - Couples can also stay together due to **perceived similarity** – because over time interests/beliefs are more aligned. Become similar as time goes on. Perceived similarity can be just perceived – they think the other person is similar to them (but actually aren't similar to their partners at all).
- Could result in a **similarity bias** – implies we will not befriend people different from us.
- A **projection bias** is when we assume other share the same beliefs we do.
- **False consensus** is when we assume everyone else agrees with what we do, even if they do not.

Harlow Monkey Experiments

- What causes **attachment** (a close bond) between mother and child? Scientists used to think it was food (mom has food). This is not true…mother provides more than that!
- Scientists conducted the **Harlow monkey experiments**
    - Separated monkeys from mothers at young age (controversial today), then given choice between 2 substitute mothers (vaguely monkey-shaped structures) that were placed in cage with baby monkey.
        - First option was <u>wire mother</u> – vaguely face like shape on top of it, and chicken wire wrapped in cylinder. And in middle was feeding tube. <u>This mother provides food.</u>
        - Second mother was <u>the cloth mother</u> – same shape/size as mother, but instead of chicken wire had soft cloth blanket around it, so <u>this mother can provide comfort.</u>
        - Baby monkeys overwhelmingly preferred to cloth mother – spent a large majority of time clinging to her. If had to eat, tried to eat while staying attached to cloth mother. Shows that attachment basis to mother is due to comfort, not food!

        - Cloth mother acts as a **secure base** – eventually monkey is comfortable enough to explore world/cage on its own, because it knows cloth mother will still be there.
            - If monkey became anxious, it would come back to cloth mother.

Secure and Insecure Attachment

- Young Babies are happy to be passed around, but then around 8 months: **stranger anxiety** (the fear of strangers) sets in.
    - ex. If baby doesn't see grandma often, they might not want to be held by even her. Child ends up being wary of strangers and even people they know. Some don't have stranger anxiety though, and some babies don't have a strong bond with their caregiver.
- **Mary Ainsworth's Strange Situation** – done to try to understand why some babies have stranger anxiety and some don't. This research focused on mother-child interactions primarily (not child-caregiver ones).
    - Experiment:
        - #1. Mother and child in room with a stranger (stranger was part of experiment). Child allowed to explore. Neither stranger nor mother interact with child. Purpose: would they explore the space?
        - #2. Then mom leaves the room (without calling too much attention to herself) and quietly leaves. Baby left alone with stranger. Purpose: what is child's response when mother leaves (does child keep playing or does child start crying)
        - #3. Then mother returns. Mother + stranger + baby in the room. Purpose: What is the child's response when mother returns (are they happy, sad about her return, or ignore her)
    - Researchers found children could be split into 2 groups – those with **secure attachment** and those with **insecure attachment**.
    - **60%** were **secure attachment**
        - **#1:** Child was secure with parent and explored room, might have stayed with mother and eventually explored room (aka. child might walk back to mother at times or look back at mother, but comfortable exploring)
        - **#2:** When parent left, child became really distressed/upset
        - **#3:** when parent comes back, they would go to the mother and be happy
    - 40% were classified as having **Insecure attachment**
        - #1: children cling to mother, and stayed with mother and did not explore.
        - #2: When mother left became upset/distress
        - #3: distress did not go away when she came back.
        - Others were avoidant – were not upset when they left the room and were indifferent to her when she returned.
- What causes this? What causes some to have secure attachment while others have insecure attachment?

- **Parenting style** – mothers who are sensitive to child and responsive had secure attachment, and those insensitive/unresponsive formed insecure attachments.
    - Insensitive parenting does not mean child abuse/neglect.
    - Difference in parenting style can be observed by a parent looking at phone while child calling for attention – do they continue to look at the phone when child is calling for attention or do they stop looking at their phone.
- Does this parenting style have any long-term effects after childhood? Yes. Early attachment style forms basis of adult relationships later in life, especially with comfort with intimacy/relationships.
    - Secure attachment with mothers leads to secure attachment with partner. Feel secure and trusting of partner
    - Insecure attachment with mother means they feel anxious about their relationship with partners as adults. Might avoid being too attached to any one person.
    - Attachment style with infants effect our attachment with our own children. Secure attachment people tend to have secure attachments with their children and insecure attachment people tend to have insecure attachments with their children.
    - How comfortable we feel with parents with first year of life affects us into adulthood.
- Parenting styles can be **authoritarian**, **permissive**, or **authoritative** (best).
    - **Authoritarian parenting**: very strict, break will of child. Punishment.
    - **Authoritative**: also strict, consistent and loving but more pragmatic and issue-oriented and listen to children's arguments. Balance responsibility with rights of child. Discipline.
    - **Permissive parenting/Indulgent parenting:** non-directive and lenient. Few behavioral expectations for child.

Aggression

- **Aggression** = any physical/verbal behavior intended to harm or destroy. Ex. Physical, verbal, or spreading a malicious rumor
- Aggression/aggressive behavior comes from combination of the 3:
    - 1) **Biology:**
        - 1. Genes: evidence: identical twins, if one is more aggressive the other is as well. With fraternal twins – not the case, and we can breed animals for aggression
        - 2. Brain structure impact on aggressive behavior: No one brain spot controls for aggression but there are circuits in brain can inhibit/facilitate aggression. The **amygdala** (part of limbic system which is composed of structures from telencephalon, diencephalon, and mesencephalon) facilitates our fear response, and when stimulated triggers aggressive

behavior. The **frontal lobe** is responsible for planning, decision making, and importantly impulse control, and correlation studies have shown criminals have decreased frontal lobe activation.(perhaps those who commit violent actions can't inhibit violent behaviors)

- **3. <u>Testosterone</u>** is hormone released by testes in men and ovaries in women. Higher in men = why men are more aggressive than women. Also why 70 y/o man is less aggressive than a 17 y/o adolescence man. High levels of high testosterone can lead to aggression, muscle building, and wider faces (rather than long round one). Can lead to irritability/assertiveness/impulsiveness, and low tolerance for frustration. Drugs that reduce testosterone levels tend to reduce aggressive tendencies.

- 2) **Psychological:**
  - **Frustration-aggression principle**, the idea that frustration creates anger which can spark aggression. Almost anything can cause frustration.
    - Ex. Physical pain or presence of crowd. Higher temperatures can also lead to frustration. (more violent crimes when the weather is hot)
  - **Reinforcement-modeling** can lead to aggression through positive reinforcement. Parents who give into demands of child during temper tantrums lead to more temper tantrums in future.
    - Also if parents yell/hit each other, child will pick up on behavior too (parents can model aggressive behavior – child can observe and pick up behavior of parents).
- 3) **Socio-cultural**
  - People act more aggressively in groups (ex. riots) – **de-individuation** – you gain an anonymous status when you are with large group of people. If people around individual act poorly, individual might act poorly too. This also explains why there is poor behavior on the internet (they are anonymous here, and those around them model poor behavior).
    - De-individualization - De-individuation is when an individual loses self-awareness in groups.
  - **Social scripts** – when people are in new situations they rely on **social scripts**, or instructions provided by society on how to act. Ex. violent video games model aggressive behavior for them. Viewing media can give them example of how they should act. Ex. Lash out at someone when something goes wrong

- Again, *seems to be a combination of all 3 factors work together to lead to aggressive factor, not only 1.*

Altruism

- **Altruism:** care about welfare of other people and are acting to help them. Beneficial to society and also individuals.
- Studies found connection between volunteerism and future health and well-being. Also higher life satisfaction and decreased risk for depression/anxiety.
- Most definitions of altruism include that altruistic person is not getting anything in return. Can anything ever be truly altruistic?
- Types of altruistic behavior: (Does altruism have an ulterior motive?)
    - **Kin selection** - people act more altruistically to close/kin than distant/non-kin people.
        - Same when people share last names, especially true if people have rare last names.
        - Morphing face as increase trust we have in other person.
        - Is this behavior altruistic if it gives us an evolutionary advantage, to pass on our genes (the genes of those closest to us)? Is it really altruism if we are helping select for genes of our kin?
    - **Reciprocal altruism** - People are also more cooperative if they will interact with that person again in the future. Giving with expectation of future reward.
        - We feel more obliged to help someone else if they have helped us.
        - This is why charities send out small gifts. By helping you out now, they hope you respond by giving them a larger gift in the future.
    - **Cost signalling** – giving signals to others that person who's giving has resources. People have increased trust in those they know have helped others in the past. Signals that the person is open to cooperation.
    - Altruism has ulterior motive in the above three. There is always a reason (not completely selfless!)
- **Empathy-Altruism Hypothesis** – suggests some people are altruistic due to empathy. High empathy = high in altruistic behaviors. Those who score higher on empathy are more altruistic.
    - **Early developmental trajectory** – Helping behaviors begin early. Some newborns cry when other newborns cry (they recognize other babies distress). Helping behavior begins around **age 2**, children share toys and *play act helping*/altruism. Age 4 begin actually begin helping.
    - Says that altruism might be a normal human behavior because it occurs at such a young age. We have a tendency to help other people without an alternative motive.

Social Support

- Let's say you had a bad day at school or work? You would call friends, parents, reach out to people online, and your other social network in this time of stress. Social support is from more than just friends/family – it's from everyone we reach out too. Individual people can give you different kinds of social support.

- 4/5 Kinds of social support: 1. Emotional support. 2. Esteem support 3. Informational support 4. Tangible/instrumental support 5. Companion support
- **Emotional support** – affection, love, trust, caring. The type that involves listening and emphasizing. Can include physical support (hugs/pats on back). Provided by those closest to you (family/close friends)
- **Esteem support** – expressions of confidence/encouragement. Things people say to let you know they belief in you. Can come from family+ friends but also therapists, teachers, coaches.
- **Informational support** – sharing information with us or giving us advice. Can come from family/friends or even articles online.
- **Tangible/Instrumental support** – financial assistance/support, material goods, or services. Taking some of your responsibilities so you can deal with other problems. Can come from a bank, people who bring you dinner when you're sick, or lend you money between jobs.
- **Companionship support** – the type that gives someone sense of social belonging. Companionship while you engage in an activity.
- Social support network is huge! Can come from family, friends, pets, coworkers, partners, community organizers, healthcare workers, etc.
- Social support is important! Social support is a major determinant of health and well-being. Good social support = less mental health issues, more likely to behave in healthy behaviors, exercising, not smoking, Can help us deal with stress.
- People with low social support report more symptoms related to depression/anxiety, more mental disorders, more likely to have alcohol and drug problems. Also higher risk of deaths from cancer and heart disease.
    - Why it's important to provide support for people around you too and also to pay attention to your own social support.
    - You are a part of the web of social support for other people just like others are a social support for you!

Social Interactions

Status

- **Status / Social Status** is a person's social position in society. Each person has many statuses, ex. One individual can be a Son, student, and friend, etc. They affect the type of interactions we have – some situations people are equal (ex. you and your friend, you feel comfortable talking things out) some not – you hold an inferior (ex. with professor – you are submissive/respectful, and less negotiate) or superior to the other (ex. President of an organization. You have control over your members. Your members respect you more so.

    - In short: Friends are equal, but if you are interacting with professor they are superior to you. Of if you're president of school organization you can be superior over members.
- **Ascribed statuses** – statuses you can't change, given from birth. ex. Prince of royal family
    - The practice of assigning such statuses to individuals exists cross-culturally within all societies and is based on gender, race, family origins, and ethnic backgrounds.[3] For example, a person born into a wealthy family has a high ascribed status based solely on the social networks and economic advantages that one gains from being born into a family with more resources than others.
    - Caste System is an example of this
- **Achieved status** – status you *earn* yourself after working for it, ex. Olympic athlete
    - An achieved status is a social position a person takes on voluntarily that reflects both personal ability and merit. An individual's occupation tends to fall under the category of an achieved status; for example, a teacher or a firefighter.
- **Master Status** In perception, an individual's **master status** supersedes other identifying traits; for example, if a woman feels that her role as a mother is more important than her role as a woman, a daughter, etc., she is more likely to identify herself as a mother and to identify with other women who label themselves as such.

Role Strain and Role Conflict

- **Role strain** – when you can't carry out all obligations of a status, tensions within one status. Causes individual to be pulled many directions by one status, ex. a student has to write two papers, five reading assignments, give a speech, two lab reports in one week.
- **Role conflict** – conflict/tension between two or more different statuses, unlike role strain. The different statuses compete for someone's time. Ex. someone who's is a parent, friend, husband, and worker. Ex; as a husband he has an anniversary and a friend is calling for their monthly get-together. OR ex. Paper due for school and son is injured and at hospital. Or ex. as a worker has to go to work and as a husband wife wants him to clean the garage.
    - **"Defined as the stress that people feel when they are confronted with incompatible role expectations across different social statuses they occupy**. A common source of role conflict is the need to balance the statuses of employee and caregiver."
- **Role Exit**: Also called Social Role Exit. When an individual stops engaging in a role previously central to their identity and the process of establishing a new identity.
    - **Example:** When an individual retires from a long career and must transition from the role of worker with deadlines and responsibilities to a leisurely life or when an individual becomes a parent and has to change their lifestyle.

Primary and Secondary Groups

- **Primary groups** – closest members of the group to you. Close intimate long-term relationships. ex. in a wedding the bridesmaids/groomsmen (usually close friends and family members). Primary groups give a sense of belonging and shared identity. You have a sense of loyalty to each of the group members (group members care about you and you care about them as well). The value of the group is just being part of it itself, not in it for some sort of goal. Primary groups provide an anchorpoint. You are born into a primary group – your family. You often meet with those of your primary group face to face and you know a lot about their lives. These close relationships w/ primary group is often seen as a source of close human feeling/emotion (love, cooperation, and concern)
    - Primary Group vs. In-Group:
        - **Primary group** is your core social group. Parents, close friends from childhood. Long term relationships formed which have a great social impact on the individual.
        - **In-group** is the group you are affiliated with based on identification - can be ethnicity, nationality, gender, religion, etc.
- **Secondary groups** – formal, impersonal, temporary, and business-like relationships, based on a limited purpose/goal. Usually short-term, and only see them sometimes. Do a few goal-directed activities with these people.
    - **Example**: You do things like attending a lunch meeting to talk business. You are only part of the group to accomplish a task or for example, earn money (means to an end) "formal impersonal groups."
    - **Example**: wedding.
        - Bride and groom sit with close friends known for a long time/close family (bridal party). *Primary group*
        - Groom played football in college. His teammates are in his *primary group* because they know each other well (countless hours practicing with each other)
        - Neighborhood of bride really were close to each other. Went to the beach, had cookouts, and the neighborhood was a giant community. This would be a *primary group* of the wife.
        - Secondary group: parents work friends, distant family, acquaintances (guests there to keep strong relationships in the future. Distant family there to avoid family drama/avoid people's feelings)

xEthnocentrism and Cultural Relativism – In Group and Out Group

- See above

Dramaturgical Approach

- "DRAMA" = acronym. Uses metaphor of theater. Audience = essential.
- Dramaturgical Approach/ Theory: Concepts of front stage self, back stage self, impression management, and communication are all relevant to the dramaturgical

approach to social interactions. Dramaturgy uses the metaphor of theater to understand social interactions. When interacting, people are assumed to act in accordance with the expectations of their audience.

- Erving Goffman (1940) studied nature of people's interactions. He noticed people planned their conduct, people want to guide and control how they're seen, and act differently alone than in public. They put the best presentation of themselves that they can.
    - Says people do all these things through process of **dramaturgy.**
- 2 parts of dramaturgy: Both help us explain how humans behave in a social setting.
    - **Front stage** – when people are in a social setting. Ex. someone watches baseball with friends even if he doesn't like baseball. Manipulating how he's seen to gain/make friends. "Putting on a front and acting for an audience" perhaps use this to your advantage one day.
        - Say "oh I love baseball" even though you don't really like baseball
    - **Back stage** – more private area of our lives, when act is over. You can be yourself. You can do what you feel makes you comfortable. Private area of your life.
        - Some things in backstage maybe nobody knows about, few people who are close to you might know about some things in your backstage
        - Ex; guy who said he loved baseball might come home and like watching cooking shows, cooking nice meals, hanging out with his cat. Nobody knows this about him.
        - It is things we do behind stage. Ex; putting on makeup! Things we do to prepare for front-stage when nobody is around.
- Some people are crossing over from back stage to front stage due to social media – putting on a front in their backstage to make a good impression.

Impression Management

- **Impression management** –our attempt to control how others see us on the front stage. Do this because we want to be viewed in a positive way. There are multiple social situations which require different **scripts** from you as an actor and hence there are multiple front stages, and you have to play a different front stage role every time. We manage our sense of self in social interactions.
    - **Ex**; All front stages - football team captain (he had to get people fired up!) and perhaps on the weekends he volunteers at the hospital (very different front stage, his role is be there for the patient and offer them help as a volunteer) and then perhaps he goes to school and in chemistry class he needs to get a rec from his chemistry teacher to get into grad school (he pretends to be interested in professors research and gives impression he is a curious student).
- **Backstage** – where you work on impression management. Ex. put on makeup, look in mirror and try different outfits (training area for impression management)

xAggression

- See above

xHarlow Monkey Experiments

- See above

xAltruism

- See above

Discrimination – Individual vs. Institutional

- **Discrimination** is differential treatment and harmful *actions* against minorities. Can be based on different factors including race, age, religion, etc. Can occur at individual or at the organizational/institutional level.
- **Individual discrimination –** *Individual person acting to discriminate* based on something (sex, religion, race, age etc.) ex. a science professor who doesn't let women into his class. (in this example sex discrimination)
- **Institutional discrimination** – organization discriminating – including governments, banks, schools etc. Example: Brown vs. Board of Education in 1954. In this court case, overturned separate schools for whites and African-Americans. Brown said these schools aren't equal, and Africans were being mistreated.
- **Unintentional discrimination** – how policies can discriminate unintentionally
    - **Side-effect discrimination** – talks about how one institution/organization/sector can influence another negatively. (Institutions – economics, politics, law, medicine, business and are all interrelated, and discrimination in one area can effect another- it is an side effect).
        - Ex. a small town where African American always get unfair verdict of guilty because they didn't think they could get off on a fair verdict (so they take lesser crime). Then while applying to a job later, don't get the job because of criminal record. Criminal justice reached unfair verdict, and potential employers are swayed too (employer is swayed and unjustly discriminates unintentional because of another institution – in this case the court system).
    - **Past-In-Present** discrimination – how things done in the past, even if no longer allowed they can have consequences for people in the present. Ex. After Brown vs. Board verdict, but girl in integrated school still doesn't feel welcome in her classroom. (Negative attitude of the past coming forward to the present and causes minority to be discriminated against unfairly)

Prejudice vs. Discrimination

- **Prejudice** = attitudes that prejudge a group, usually negative and not based on facts. Make same assumptions about everyone in a group without considering their differences. Ex. CEO doesn't think women are capable of running a team.
- **Discrimination** = differential treatment and harmful actions against minorities. ACTIONS ARE BEING TAKEN on negative-attitude (going a step further from prejudice) Ex. say there's a woman who's very good at the job, but doesn't promote her just because she's a woman.
    - Ex. Discrimination examples: Jews in WWII in Germany required to where yellow stars and in Apartheid in Africa from 1948-1994 where negative attitudes and action against minority (a sign that says for use by white persons only). Actions taken in both situations.

Organizations and Bureaucratization

- Organizations and bureaucracies play a large role on our lives.
- **Organizations** are institutions designed for a specific purpose, collective goal, and try to achieve maximum efficiency. Ex. Postal Service (purpose: deliver mail) , McDonalds (food), Time Warner Cable (TV/Internet access) etc.
    - **Utilitarian Organizations** – members are paid/rewarded for their efforts, ex. Businesses and government jobs, and universities (receive diploma in exchange for your time).
    - **Normative Organizations** – members come together through shared goals, ex. religion groups or MADD (Mothers against Drunk Driving). Positive sense of unity and purpose.
    - **Coercive Organization** – members don't have choice about membership, ex. people in a prison, or the military (you need to be discharged to leave).Usually highly structured and have very strict rules
- Organizations achieve maximum efficiency through **bureaucracy** – the rules, structures, and rankings that guide organizations. (DOES NOT mean something negative, lines, or red tape)
    - **Bureaucratization** - process by which organizations become increasingly governed by laws and policy. Ex. customer service, now move through 12 menu options before reaching someone to help you.
    - **Iron rule of oligarchy –** even most democratic of organizations become more bureaucratic over time until they're governed by select few. Why? Conflict theory explains it. Once person gains leadership role in organization they might be hesitant to give it up**.** (those with power have vested interest in keeping it) **Also those who achieve power might have skills that make them valuable.**
        - **Oligarchy:** a small group of people having control of a country, organization, or institution.
    - **McDonaldization** – policies of fast food organizations have come to dominate other organizations in society. Primarily, *Principles of efficiency, calculability,*

predictability, uniformity, and control – These principles have come to dominated everything, from medicine to sporting events to entertainment,
    - ex. movie theatres all look and work similarly, with same concession stands look same, carry same brands and same popular movies, with same seating arrangements, look the same, and #of screens is the same. All ticket systems now the same (especially online). Same pre-show entertainment.
    - Not necessarily a bad thing. Pervasive throughout society.

Characteristics of an Ideal Bureaucracy

- **Max Weber** (sociologist) studied structure of organizations*, 5 main characteristics of an ideal bureaucracy*, regardless of goal of organization (organization can be for business, charity, etc.) All should show these characteristics:
    - **Division of labour** – people are trained to do specific tasks.
        - Pro – people are better at tasks, and increased efficiency.
        - Con – increase alienation in workers, separating them from other works (conflict theory), and they don't see work from beginning to end. Can lead to less satisfaction which leads to less productivity. Also can lead to **trained incapacity**, where workers are so specialized in tasks they lose touch with overall picture.
        - Ex. Administrators don't teach classes at university and professors are not responsible for building maintenance.
    - **Hierarchy of organization** – each position is under supervision of higher authority. Not all people of an organization are equal.
        - Pro – clarify who's in command
        - Con – deprive people of voice in decision making (especially of those lower in chain of command) and shirk responsibility, especially in unethical tasks ("I was just following orders"). Also allows individuals allows them to hide mistakes (often serious mistakes because no one person interacts with all members).
    - **Written rules and regulations**
        - Pro – clear expectations, uniform performance, equal treatment of all employees, and sense of unity/continuity to organization (laws/structures of organization stay same as members come/go)
        - Con – stiffens creativity, and if too much structure discourage employees from taking initiative. **Goal displacement** (rules become more important than goals of organization)
    - **Impersonality** – how individuals and officials conduct activities in unbiased manner
        - Pro - equal treatment
        - Con – alienation, discourage loyalty to the group

- **Employment based on technical qualifications** –hiring in bureaucracy is based on qualifications on person has and not favouritism/personal rivalries
  - Pro – decrease discrimination
  - Con – decrease ambition (only do what is necessary to secure job and do nothing more). Leads to **Peter Principle**, where every employee in hierarchy keeps getting *promoted until they reach level of incompetence* (they remain at a position because they are not good enough at the job to get promoted any further).

xSocial Support

See above

Self-Presentation and Interacting With Others

xCharles Cooley – Looking Class self

- See above

x George Herbert Mead – The I and the Me

- See above

xThree Components of Emotion and Universal Emotions

- See above

Biological explanations of social behavior in animals

Animal Behavior: Foraging

- One of most important animal behaviors is **Foraging** - the search for food in animal's environment. Can't survive or reproduce without it.
- Cost-benefit analysis associated with foraging – Cost: going out to get food can take up time and energy. Benefit: it survives. Goal is to get highest energy yield while expending least amount of energy.
  - Includes looking for food, and stalking prey.
- 2 main foraging strategies – solitary foraging and group foraging
  - 1) **Solitary foraging** – animal looks for food by itself. Ex. Tigers do this.

- 2) **group foraging** - animals look for food in groups. Hunting based on both your behavior and those around you. Can lead to competition within a group if food is scarce. Benefit of this strategy is that animals can take down larger/more aggressive prey and everyone can benefit. ex. Lions do this.

- Foraging behavior is driven strongly by **genetics**, but can also be gained through learning, ex. young primates copy adults and this is how they learn to forage. This teaches them how to hunt and what kinds of things they should be hunting.

Animal Communication

- Humans communicate with each other through **language** (how we communicate ideas, thoughts, feelings and how we respond to thoughts/feelings of others), **non-verbal cues** (can tell if someone is happy/sad, anxious/angry by smile, frown, etc)., and **visual cues** (ex. painting rooms pink vs. black)
- Other animals have ways of communicating as well, not with language but with many non-verbal cues and visual cues, and other types of cues not used by humans.
- **Who** are animals communicating with?
  - Members of same species
  - Members of other species. Ex. Some frogs use bright colors to signal they are toxic so communicate with other animals that they should not eat them, cat communicates with a human when they are hungry
  - **Auto-communication** – can give information to themselves. Ex. bats and echolocation and this allows them to gain information about the environment
- **What** are they trying to communicate? What is the main function of animal communication?
  - Mating rituals, to attract opposite sex. Ex. Some animals use bright colors, complicated dances, and specific verbal calls.
  - To establish/defend territory. Tell other animals to back off. Ex. Birds get territorial when they lay eggs.
  - To convey information about food location
  - Alarm calls, to warn others about predators
  - Signal dominance and submission. Ex. Dogs have a stance to indicate who came out on top after a fight.
- Animals communicate with each other and humans.
- BUT, a WARNING. Watch about for **anthropomorphism** – attributing human characteristics to non-human animals. We can interpret and describe meaning to action of animals but we can't be certain if we are correct about these interpretations because we can't speak to the animals. ex. pet sleeping with you at night and you can assume that they love you but maybe they are just there because of your body heat.

Types of Animal Communication

- Animals can communicate with each other through sound, chemical signals, somatosensation, and visual cues.

- **Sound** – Ex. Dogs can bark, birds can sing. Sound can convey a lot of information event though they do not have language, ex. mating calls, warning'/alarm sounds, etc. Not always produced by mouth of an animal (ex. Crickets rub legs together to attract mate, rattlesnake gives a warning signal via shake of his tail). Sound as communication is useful because it's fast, can reach many members at once, but not very private and exposes the animal's location
- **Chemical signals/Olfactory Signals** – Gain info from the environment through smells. They can so release scents for communication called **pheromones** (can be for mating, most often) or to guide other members to food (ants use this method). Can detect predators using smell, or presence of other animals. Chemical signals tends to be a lot slower than sound, but a lot longer lasting. But because of this long lasting effect, chemical signals are considered "noisy" – a lot of chemical signals in a given area.
- **Somatosensory communication** – Communicate through touch and movement. Ex. mating dances. Movement can also convey food location (bees), pair/group bonding (ex. birds cuddle/prune mates), body language (facial expression/body language for emotion – ex. Dogs can show teeth when threatened, perk up ears if alarmed). Also *seismic communication* (ex. movement of bug in spider's web signals to spider to find it), *electro-communication* (fish) .
    - Signals can be detected by predators as a way to find food.
- **Visual cues** – Overlap between visual cues and somatosensory communication.
    - *Visual cues to find a mate* (ex. peacock extends feathers to attract a peahen),
    - *Visual communication through color* (ex. A beak color on a certain bird allows it to communicate to young and assist in feeding young…frogs use color to signal they are toxic to other animals)
    - *Mimicry* (ex. monarch butterflies are poisonous to birds and colored in a specific way, but viceroy butterflies that are not poisonous to birds use same pattern/colors (they mimic) the monarch butterfly and this provides the butterfly lots of protection).
    - *Camouflage* (visual cues used to NOT communicate…ex. Frogs use this and shade its skin like leaves).
    - More types: *bioluminescent communication* (ex. fireflies glow to attract mate), *gaze following* and *social cues* (ex. look where some1 else is looking…silent way to signal location of food or predator).
    - More examples that were not included in video.

Mating Behavior and Inclusive Fitness

- Mating is the pairing of opposite sex organisms for purpose of reproduction and propagation of genetic material. Includes act of mating and the other behaviours associated with it. Also events that occur after mating, like nest building and feeding the young.
    - Ex. The Superb Bird of Paradise does a complicated dance.
- Mating strategies when searching for a mate

- 1) **Random mating**- all individuals within a species are equally likely to mate with each other. Mating not influenced by environment/heredity or any behavioral/social limitation. Ensures a large amount of genetic diversity. {Bridge: hardy Weinberg equilibrium assumes this}
- 2) **Assortative Mating** – Non-random mating where individuals with certain phenotypes/genotypes/similarities/genes/physical appearance tend to mate with each other at a higher frequency, ex. large animals mate with large animals and small animals mate with small animals.
  - Can result in inbreeding which is a problem that occurs if animals too genetically similar mate. Tends can be harmful to species overall. Increase likelihood of harmful recessive traits being passed on to offspring.
- 3) **Dis-assortative Mating (Non-Assortative Mating)** – opposite of assortative mating – situation where individuals with individuals with different or diverse traits mate with higher frequency than with random mating.

- Which strategy is best? Scientists think assortative mating, because despite dangers of inbreeding, help to increase inclusive fitness of an organism.
  - **Inclusive fitness** – concerns the # of offspring an animal has, how they support them, and how offspring support each other. Inclusive fitness is thinking about fitness on a larger scale – evolutionary advantageous for animals to propagate survival of closely related individuals and genes in addition to themselves.
    - This inclusive fitness concept can solve problems with evolution which states that animals (including humans) can be predisposed to act selfishly. But people are kind to others/help others. We are helpful/altruistic of those who are similar to us!

Evolutionary Game Theory

- Introduction to Game theory: usually talked about in reference to decision making, but can also use it for evolution and animal behavior. Game theory – social science/economics typically but also can explain everyday behavior. Game theory tries to predict behaviors we would expect to see when an individuals are playing a game. It looks at individual strategy and looks at the behaviors of what other animals will do.
  - Ex; effect of a decision effect not just an individual but the overall group.
- **Evolutionary game theory** tells us those with best fit to environment will survive and pass on to offspring, and those genes will become more common in successive generations.
  - Reproduction and environment are central to evolutionary game theory.
    - Reproduction important to game theory because it can't happen in isolation and it needs to involve others
    - Environment – how organism fits in with social and physical environment. Work with other organisms to find food, raise young, deal with predators. [Fitness also depends on behavior of group]

- Predicts the **availability of resources** and **social behavior** (important for who they mate with). Strategy of each individual depends on strategy exhibited by other players.
- A important *difference* between evolutionary game theory and general game theory:
  - Game theory involves intention, where participants reasoning about behaviours of others.
  - Evolutionary game theory different because decisions might not have a conscious intention on part of players.
- Evolutionary game theory helps us predict traits we would expect to see in a population. Evolutionary game theory predicts the appearance of (helps us see) evolutionary stable strategies (behaviours that persist in population once present).
  - Ex. Altruism – 2 groups of monkeys, one selfish and one not. Selfish group doesn't alarm others of predators. Non-selfish group alerts others and leads to overall success of group over time. Making a call at their own expense is sometimes good (the one who makes the call might not survive, but those similar to it can be helped…this is better strategy for the population).
    - Altruism increases fitness of group!

Discrimination

xDiscrimination -- Individual vs institutional

See above

xPrejudice and discrimination Based on Race, Ethnicity, Power, Social Class, and Prestige

See above

xStereotypes, Stereotype Threat, and Self-Fulfilling Prophecy

See above

Society and Culture

Social Structures

Macrosociology vs. Microsociology

- 2 different analysis of sociology to study societies. Need a place to start or it'll be overwhelming – individual people, different groups, and communities/cultures/subcultures in a population.
- **Macrosociology** – large scale perspective, looking at big phenomena that affect big portion of population. Social structures and institutions, whole civilizations/populations. Looking for patterns and effects the big picture has on lives on small groups. Broad social trends in cities, and statistical data (as long as you're careful about not making wrong interpretations).
    - Deals with matters like poverty, war, health care, world economy
    - **Functionalism** comes from macrosociology – looks at society as a whole and how institutions that make up the society adapt to keep society stable and functioning.
    - **Conflict theory** is also a macro-perspective – the idea society is made of institutions that benefit powerful and create inequalities. Large groups are at odds until conflict is resolved.
- **Microsociology** – face to face interactions, families, schools, other social interactions. Interpretive analysis of the society, look at sample of society and how individual interactions would affect larger groups in society. Ex. doctor-patient interactions, or family dynamics.
    - **Symbolic interactionism** - social theory that's a micro-perspective, focuses on the individual and significance they give to objects, events, symbols, etc. in their lives.

Social Institutions

- Institutions are essential parts of a society, ex. police stations, hospitals, businesses, Walmart, trader joes. Impose structure on how individuals behave. Guide what we do.
    - Institution can create rules that impact all of society and guide what we do. Individuals are reliant on institution and community.
    - They don't need any 1 individual, just need many of them, and each individual is very replaceable. Institutions are created by individuals but continue even after an individual is gone. Whereas without institution major changes can occur to individual. Imbalance in power.
    - A form for filling the need. Meet the need of a society. Family institution = people year after year. Medicine = fill the need of health. Institution = for advancement of society.
- Two views of institutions

    - Conservative View: institutions are natural by-products of human nature.
    - Progressive View: institutions are artificial creations that need to be redesigned if they are not helpful. Ex. Businesses
- We think of institutions as a business/corporation, sociologists think of social structures, governments, families, hospitals, schools, laws, religion, businesses, etc. All continue without any 1 individual.

Social Institutions – ex. Education, Family, Religion

- Education, Family, Religion – each of these institutions play a fundamental role in creating and supporting society, and each shape the individual in that society.
- **Education** – more than going to school, but there's a:
    - **Hidden curriculum:** we learn how to stand in line, wait our turn, and treat our peers. We internalize social inequalities, when boys and girls are treated differently by their teachers.
    - Expectation of teachers affects how students learn. Teachers tend to get what they expect from their students. Expectations are met.
    - Teachers put students in categorizations with different expectations, but what if categorization is wrong? The student might then just meet the teacher's expectations rather than exceeding them and reaching their true potential. Sometimes limiting factor comes from outside the classroom.
    - Sometimes limiting factor comes from outside classroom. Schools experience educational **segregation** and stratification, because we fund schools through property taxes, which is why different districts are funded differently. Residential segregation of education.
- **Family** – defined by many forms of kinship, including marriage, blood, or adoption. Small nuclear family is more emphasized in the US.
    - Different family values go with different social values of family and economy,
        - ex. rural families were production based, so large families.
        - Urban families are consumption based, so large family means more strained on resources. Urbanization: changes in expectations on family roles and child care.
        - Family can be a married couple, generation skips, single parents, step family, gay couples, no one uniform type.
    - **Marriage** – new families usually begin via marriage. Marriage is when people join together. In the US, people can experience multiple marriages and in the US we are Serial monogamous. Why **divorce** is more common, and creates tension (particularly when a parent remarries or during custody battles).
        - Some families contain violence.
        - ex. in **child abuse**: child is physically abused.
        - More common than child abuse: **abuses through neglect** – children's basic needs aren't met**,** lack of supervision, poor nutrition, insufficient clothing.

        - **Elder abuse** also occurs when family isn't ready for responsibility of taking care of elders and expense of nursing homes. (robberies, threats, neglect of elderly members)
        - **Spouse abuse** (can be physical or psychological like all abuse). Usually men are perpetrators, but men can also be victims. Economic issues are usually the cause. Controlling and limiting the support network of a victim. Makes it difficult for victim to get out of abuse. Women's shelters don't always get kids, while social stigma of men not getting abused keeps them quiet.
- **Religion** – religiosity: how religious a person is can range from private beliefs/spiritual routines, to institutionalized religion, celebrating certain holidays, reading a spiritual text, praying often etc.
    - **Ecclesia** – dominant religious organization that includes most members of society, ex. Lutheranism in Sweden and Islam in Iran.
    - **Churches** are established religious bodies in a larger society. [ex. Roman catholic church]
    - **Sects** tend to be smaller and are established in protest of established church. They break away from churches. Ex. Mormon/Amish
    - **Cults** are more radical, reject values of outside society. Rise when there's a breakdown of societal belief systems, but usually short-lived because depend on inspirational leader who will only live so long.
    - **Religion has been effected by:**
        - **Modernization: more info available to public, less emphasis on religion.**
    - **Secularization** is the weakening of social and political power of religious organizations, as religious involvement declines.
    - **Fundamentalism** – reaction to secularization, go back to strict religious beliefs. Create social problems when people become too extreme.

Social Institutions – Government, Economy, Health and Medicine

- **Government** – we give government the power and authority to manage the country.
    - Some governments take into account will of people, like **democracy**. [law making, choosing officials]
    - Others rule autonomously like **dictatorships**, no consent of citizens. [obedience to authority]
    - **Communism** – classless, moneyless community where all property is owned by community.
    - **Monarchy** – government embodied by single person, king/queen is the figurehead.
- **Economy**
    - **Capitalism** – private ownership of production with market economy based on supply and demand.

    - **Socialism** – motivated by what benefits society as whole, common ownership of production that focuses on human needs and economic demands.
- Division of labour in government and economy is **functionalist** – everyone is required to have responsibility in society.
    - We value certain labours differently. Ex. Garbage men (essential to society) not as valued as athletes (non-essential). We value jobs that require lots of specialization, rather than jobs essential in our society – creates inequalities because not everyone has access to those valued professions, due to limited education/resources. These disparities in healthcare, medicine, and education.
- **Healthcare and Medicine** – medicine exists to keep people healthy.
    - **Medicalization** occurs when human conditions previously considered normal get defined as medical conditions and are subject to studies, diagnosis, and treatment. Ex. mental health type issues (sadness/attention), and physical issues like birth. People are over diagnosed (depression/ADD). Sad =/= depressed and can't focus =/= ADD. Birth – women and doctors plan C-section instead of natural births.
        - "concept of medicalization refers to the process in which something, usually a behavioral problem (such as, for example, alcoholism) becomes described and treated as a medical condition when it was not previously conceived in that way.
    - **Sick role** – expectation in society that allows you to take a break from responsibilities. But if you don't get better or return, you're viewed as deviant and harmful to society.
    - **Delivery of healthcare** – massive inequalities in terms of access. We take care of elderly through Medicaid and Medicare, and children through health child insurance. But people in between are left behind – those who populate working force (when they get sick they can seriously effect society). Affordable Care Act is trying to fix this but too early to tell. Spend a lot of $ on healthcare without desired outcomes, because we invest a lot more in helping people when they are sick instead of developing preventative medicine.
    - **Illness experience** – process of being ill and how people cope with illness. Being ill can change a person's self-identity. Diagnosis of chronic disease can take over your life where every decision revolves around the disease. Stigmas associated with certain diseases like mental illness or STDs that can affect how others perceive you. . How
        - People experience of disease varies too if they have access to resources like palliative care.
    - **Social epidemiology** looks at health disparities through social indicators like race, gender, and income distribution, and how social factors affect a person's health. Correlation between social advantages/disadvantages and distribution of health + disease. Social epidemiology focuses on the contribution of social and cultural factors to disease patterns in populations (the social determinants of a disease), Emphasized how social factors, such as class or race/ethnicity, affect

the distribution of disease and health. As a subfield of epidemiology has a significant overlap with sociological perspective on health and disease. Both types of research call attention to the ways in which health and disease are conditioned in a social context.

- **A branch of epidemiology:** the branch of medicine that deals with the incidence, distribution, and possible control of diseases and other factors relating to health.

Functionalism

- **Functionalism** is a system of thinking based on ideas of Emile Durkheim that look at society from large-scale perspective, and how each part helps keep society stable.
  - It says that society is heading towards equilibrium. Ex. local businesses must adapt to new ways to cater to customers (in response to a disrupter such as amazon for example)
  - Also called structural functionalism. The structural functionalism approach is a macro-sociological analysis, with a broad focus on social structures that shape society as a whole.[1]
- Durkheim imagined a balance between institutions and social facts
  - **Institutions** are structures that meet the needs of society like education systems, financial institutions, marriage, laws, etc. [also: business, law, military, police force, mass-media, nongovernmental organizations, religion]
  - **Social facts** are ways of thinking and acting formed by society that existed before any one individual and will still exist after any individual is dead. Unique objects that can't be influenced and have a coercive effect over individual only noticed when we resist. Ex. the law. Others are moral regulations, religious fates, and social currents like suicide/birth rate (one person committing suicide has no effect of suicide on society). Facet of society itself and a necessary structure.
- Society is dependent on structures that create it, like a biological cell is dependent on parts that make it up.
  - Intended consequences of institutions are **manifest functions**, ex. businesses provide a service. School – educate people so they can get jobs. Laws – maintain social order.
  - Unintended consequences, ex. schools expose students to social connections/new activities, and businesses connect people across society – **latent functions**, indirect effects of institutions. (unrecognized consequences)
  - **Social dysfunction** is process that has undesirable consequences and may reduce the stability of society.
- Durkheim questioned how do societies stay together
  - **Small societies** are held together by similarities, but only works for small ones…evolves into large society. (population growth in a small space…and people become specialized)

- In **large societies** individuals become interdependent on each other as everyone is specialized in different roles. Forced mutual independence.
- In functionalism, a change to production/distribution/coordination will force others to adapt to maintain stable state society. Social change threatens mutual dependence of people in that society. Institutions adapt only just enough to accommodate change to maintain mutual interdependence.

- Problems of functionalism: focuses entirely on institutions without regard for individual (only acknowledged). Also largely unable to explain social change and conflict, so focussed on equilibrium (between social facts and institutions) little change and conflict is modelled and no conflict can occur. More to society than just stable state of its part, but functionalism is still useful in examining the functions of its integral parts.

Conflict Theory

- Focuses on inequalities of different groups in society, based on ideas of Karl Marx that believed society evolved through several stages: **feudalism -> capitalism -> socialism.**
  - 19th century Europe was capitalist –
    - rich upper class called **bourgeoisie** (minority) and poor lower class called the **proletariat** (majority).
      - The term "bourgeois" refers to individuals of a social class that have wealth, power, or influence.
      - The term "proletariat" refers to individuals from a working class, where their worth is determined by their ability to perform manual labor.
    - Upper class had more power (owned the factories, and sold what they produced from factories). Lower class depended on upper class (the factory owners) to get paid, but upper class also depended on lower class for their labour.
    - Significant economic inequality, which Marx believed led to change in society. Lower class united to create **class consciousness** as they realized they were being exploited. Exploitation would allow lower class to overthrow the status quo. A society where one group exploited another group economically would eventually lead to its own destruction.
  - The **thesis (existing generally accepted state)** was that bourgeoisie ran factories and working class provided labour. Thesis causes the formation of the reaction – antithesis (opposed the accepted state).
  - **Antithesis** - Desire of working class to change was the thesis. The anti-thesis is the reaction to the thesis, the push-back from those unhappy with the status quo.
    - **Thesis** + **antithesis** can't coexist peacefully. Thesis is happy while antithesis is looking for change always.
  - Struggle would lead to a compromise - a **synthesis** of the two by creating a new state. Would eventually become new thesis.

        - Could lead to members of the working class becoming managers. Creating a new middle class that might have more power than the factory owner. This creates a new thesis/antithesis. Thesis is always is the more powerful party.
        - Antithesis always wants to oppose the thesis and there is a constant struggle of tension/unrest between the two opposing sides.
- **Ludwig Gumplowicz** expanded on Marx by proposing that society is shaped by war/conquest, and cultural/ethnic conflicts lead to certain groups becoming dominant over others.
- **Max Weber** said he did not believe collapse of capitalism was inevitable, but argued that several factors moderate people's reaction to inequality.
    - Introduced: three independent factors Class/Status/Power
        - **Class:** A person's economic position in a society, based on birth and individual achievement. Weber differs from Marx in that he does not see this as the supreme factor in stratification. Weber notes how corporate executives control firms they typically do not own; Marx would have placed these people in the proletariat despite their high incomes by virtue of the fact they sell their labor instead of owning capital.
        - **Status / Prestige**: A person's prestige, social honor, or popularity in a society. Weber notes that political power is not rooted in capital value solely, but also in one's individual status.
            - For example: Poets or saints can have extensive influence on society despite few material resources.
        - **Power:** A person's ability to get their way despite the resistance of others, particularly in their ability to engage social change.
            - For example, individuals in government jobs, such as an employee of the Federal Bureau of Investigation, or a member of the United States Congress, may hold little property or status but still wield considerable social power.
- The **equal rights** and **women's suffrage** movements were all conflicts that resolved in a new **thesis**.
- The good of conflict theory: Conflict theory models drastic changes that occur in a society
- Problems of conflict theory: doesn't explain the stability a society can experience, how society is held together (unity), despite some members not liking the status quo.

Social Constructionism

- **Social constructionism** argues that people actively shape their reality through social interactions/agreement – it's something constructed, not inherent. Things are **social products** made of the values of the society that created it.
    - A **social construct** is concept/practice everyone in society agrees to treat a certain way regardless of its inherent value, ex. money.

- **Social constructionism** is theory that knowledge is not real, and only exists because we give them reality through social agreement – nations, books, etc. don't exist in absence of human society.
    - The **self** is a social construct too – our identity is created by interactions with other people, and our reactions to the other people. (and reaction to expectations to society)
- 2 types of social constructionism: weak and strong
    - **Weak social constructionism** proposes that social constructs are dependent on:
        - **Brute facts**, which are the most basic and fundamental facts. Ex. brute facts are what explain quarks (or what makes the quarks) in atoms, not the atoms themselves (something that is not defined by something else).
        - **Institutional facts** are created by social conventions and do rely on other facts. Ex. money depends on the paper we have given value.
    - **Strong social constructionism** states that whole of reality is dependent on language and social habits; all knowledge is social construct and there are no brute facts. We created idea of quarks and everything we know to explain it. No facts that just exist.
- Main criticism to social constructionism is it doesn't consider effects of natural phenomenon on society, and for strong social constructionism it has difficulties explaining those phenomena because they don't depend on human speech or action. Strong SC only explains reality through thoughts of humans, not using fundamental brute facts.
- Associated with: Berger and Luckman
- "Presumes that ideas (such as knowledge about health and disease) are created through historical processes that are socially defined and culturally distinct. Thus, variation in mental illness classification across societies with different cultures suggests that such disorders are socially constructed."

Symbolic Interactionism

- Takes a small-scale view of society, focuses on small interactions between individuals like hanging out with a friend. Sees society as buildup of everyday typical interactions.
- **Symbolic interactionism examines small scale (or micro level) social interactions, focusing attention on how shared meaning is established among individuals or small groups**
- **"explains social phenomena in terms of the meanings that they hold when people interact with one another.**
- Addresses the **subjective meanings** people believe to be true – **meaning** is the central aspect of human behavior. Humans ascribe meanings to things, and act towards those things based on ascribed meaning. **Language** allows humans to generate meaning through interactions, and humans modify meanings to **thought processes**.
- Particularly interested in symbols use that people use to contribute values/beliefs to others.

- Developed by **George Herbert Mead**, believed development of individual was a social process as were the meanings individuals assigned to things. People change based on interactions with objects, events, ideas, others, and assign meaning to things to decide how to act. [Tree means shade for example]
- **Herbert Blumer** continued Mead's work. He proposed 3 tenants to explain symbolic interactionism:
    - 1. We act based on meaning we've given something. Ex. tree is place to rest.
    - 2. Different people assign different meanings to things. We give meaning to things based on social interactions, ex. someone tells us tree is infested with ants. But we have different views of the tree and we act differently.
    - 3. The meaning we give something isn't permanent, ex. something bites my back, so might not sit under next tree one finds. (Tree now is defined as shade on a hot day with a potential of getting bit)
- Criticism – doesn't ask same questions as large scale sociologists do. Sometimes considered as supplemental instead of full theory, because restricted to small interactions between individuals. But gives different perspective necessary for fully understanding society. Capable of explaining of how societies can change when created/recreated by social interactions.

Feminist Theory

- A contemporary approach of looking at world from macro-perspective, developed from feminism movement originating from conflict theory by focussing on stratifications/inequalities in society. It examines women's social roles/experience in education, family, and workforce.
- It looks beyond more common male-based perspective to focus on gender inequalities in society.
- Women face **discrimination** (unjust treatment of individual because they belong to a certain group), **objectification** (when someone is regarded as an object and treated as less important), **oppression** (where women are treated unjustly and encouraged to occupy gender based social roles)**,** and **stereotyping** (all women are viewed under the same oversimplified image).
- Different types of feminist theory:
    - 1) **Gender differences** – socially constructed created via process of socialization. Society creates and passes down norms, customers, and expectations for gender from generation to generation. Creates a system that rewards/punishes the expectations created. Examines how women's position in social situations differ from men – different values with women (femininity) than men (masculinity). Women seen as soft, caretakers, emotional, submissive (vs men: tough, aggressive, warriors). Different gender roles: woman assigned to take care of family and stay at home, while men go to work/war. Woman are marginalized and confined to lower limit in society. Women have been objectified as sexual instruments.

- 2) **Gender inequality** – central to all behavior/organization in society. Women subordination is viewed as inherent feature. Our society is a **patriarchy** – men constitute the governing body as heads of families and communities. Married women have higher stress levels than married men/unmarried women, and have less influence in public sphere (because they focus on private sphere at home). Gender division of labor - men occupy higher paying jobs/prestigious positions.
    - Ex. Ben Barres began his life as women, and after sex change he noticed people thought his research was much better than his sister Barbara's. However, Barbara was the same person. (Social bias created by a work done by a woman (exists even in academia)).
- 3) **Gender oppression** – women are not only unequal as men, but they're oppressed, subordinated, and abused. Positive state of being a women not acknowledged in patriarchal society. Institution of family is especially beneficial to men. Family was split into 2 types of labour – domestic labour was done by women (no pay), while men worked outside home in labour/industry. Without men working, family wouldn't survive.
    - Split role created educational and economic gap between men and women. Men had more social power. [Power sometimes expressed as physical violence].
- 4) **Structural oppression** – women's oppression and inequality are due to capitalism, patriarchy, and racism. Direct parallel to conflict theory. Women like working class are exploited because of capital model, but not all women express oppression in same way. Linked to race, class, sexual orientation, age, and disability. Men are associated with mind, while women are associated with body. [Woman objectified in society in many ways – fashion, child bearing, diet programs]. Men have not been oppressed. Men are expected to be active participants in society, women are expected to be passive].
    - Language is gendered. Mailman, policeman, fireman (feminist use mailperson, police officer, fire officer to reverse this oppression).

- Feminist theory is not an attempt to replace men – different perspective on society to point out inequalities that exist between men and women due to institutions of society. Inequality is a central part of society.
    - Feminist theory focuses on different expectations, salary differences, gender inequalities that permeate everyday life

Rational Choice Theory and Exchange Theory

- Rational Choice Theory and Exchange Theory centre on economics.
- **Rational Choice Theory** - people not only motivated by money, but do what's best to get better.
    - Main assumption is the idea that everything people do is fundamentally rational – a person is acting as if they were weighing costs and benefits of each action. Maximize personal gain. Pattern of choices (not an individual choice).

- People act in self-interest, driven by personal desires and motivated by goals.
- People calculate the cost and benefits of each action and choose the one with the best outcome for themselves.
- How do we calculate value of these actions? Social resources being exchanged – time, information, approval, prestige, etc. (determines value)
- Theory assumes you can explain social change/social institutions.
- 3 main assumptions:
  - 1. **Completeness** (every action can be ranked), ex. A is preferable to B which is preferable to C. (C is not then preferable to A). (A>B>C)
  - 2. **Transitivity** (since A is preferable to B is preferable to C, therefore, A is also preferable to C). (same as math A >B >C, Therefore A>C).
  - 3.) **Independence of irrelevant alternatives** (if I have a fourth option X, won't change order of how I ranked first 3 options. Just add it in to existing order. (A>B>C, & B>X>C, Therefore: A>B>X>C).
- Rational Choice perspective assumes that individual behavior will be based on an implicit analysis of the cost and benefits of actions.

- **Exchange Theory** / Exchange-Rational Choice Theory – application of rational choice theory to social interactions. Exchange theory addresses decision making via cost-benefit analyses
  - Looks at society as series of interactions between individuals.
  - Used to study family relationships, work relationships, partner selection, parenting, etc. (interpersonal interactions).
    - **Sexual selection** – natural selection arising through preference for one sex for characteristics in individuals of the other sex
    - **Social selection** – idea that an individual's health can influence their social mobility. Also that social conditions can affect reproductive rates of individuals in a population. **Social selection** is an alternative theory to sexual selection proposed by the evolutionary biologist Joan Roughgarden.
      - the differential action of social conditions or agencies on the longevity and reproductive rates of individuals and strains in the population <war is a factor in social selection>
  - Interactions are determined by weighing rewards and punishments of each action.
  - Basic principle behind exchange theory – behavior of individual in interaction can be figured out by comparing rewards and punishments.
    - Rewards: can be social approval, money gifts, and positive gestures (a smile).
    - Punishments: negative gestures, social disapproval, public humiliation
  - Assumptions: People seek to rationally maximize their profits, behavior results in a reward is likely to be repeated - more often reward is available the less valuable it is (think: supply and demand, more supply = less valuable/"price"), interactions operate within social norms, people access have information they

need to make rational choices (debateable, but is assumed), human fulfillment comes from other people (interdependence in social exchange), and standards people use to evaluate interaction changes over time (different from person to person – reward to one person can be punishment for another).
    - What kind of interactions? Self-interest and interdependence guide human interactions. We form relationships to benefit ourselves, no one is self-sufficient.
        - Subjective interactions of rewards + punishments of each interaction.
- Critiques – are we really rational? Some people's choices are limited by gender/ethnicity/class, and make choice not in best interest. And why some people follow social norms that act in best interest of others (taxes, volunteering). And is it really possible to explain every social structure by actions of individuals? Critiques dislike that all human interactions are a rational process of pros/cons and makes relationships linear – when they aren't.

Social Theories Overview (Part 1)

- **Functionalism** – how society can exist over time. Society is always trying to come to an equilibrium. Institutions remain constant and only make minor change when stability is lost to fill need of society. Ex. Business institution had to adapt to online shopping boom. Change is bare minimum to become functional again.
- **Conflict Theory** – how societies changes and adapt over time through conflict. Two opposing positions would merge to create a new society where both are content. Ex. Class struggle of 19th century Europe.
- **Social Constructionism** – what society is rather than how it exists/changes. Everything is created from the mind of society. Agreement that something has meaning and value that it doesn't have intrinsically, ex. Money. Everything only has value because everyone agrees it has value; we construct the world around us.
- **Symbolic Interactionism –** Puts a lot of focus on individual and how they behave – based on meanings we give to things, ex. Tree = shade. People are created by their society, and act based on past experiences, and meanings they've given things. Not everyone gives same meaning to same things. We interact with the world to give it meaning. symbolic interactionist perspective, which is predicated on interaction and interpretation
- Functionalism = looking at stability of society, conflict theory = how society changes, social constructionism = how things are given value, symbolic interactionism = how individuals act.

Social Theories Overview (Part 2)

- **Feminist Theory** - macro level perspective on society, focussing on gender inequalities inherent to patriarchal capitalist societies, where men occupy governing positions in family and community. Both men and women often forced into gender-based roles. Focuses on gender differences, gender inequalities, gender oppression, and structural

oppression. [Feminist theory does not intend to replace men at the top of the social ladder]

- **Rational Choice Theory** – people always take rational actions, weighing costs and benefits of each action to gain most benefit. 3 assumptions: completeness, transitivity, and independence of irrelevant alternatives. [Do we all make rational choices, and why would we do something for someone else, is every human interaction just a rational process?)
- **Exchange Theory** – application of Rational Choice Theory to social interaction. Family, work, partner selection, parenting, interpersonal relationships. People behave with goal of maximizing own rewards while minimizing punishments, and people can make rational choices in social norm, and self-interest and interdependence guide interactions, and human relationships from cost-benefit analysis.

Relating Social Theories to Medicine

- **Functionalism** – if we look at medicine from this point of view, we ask: What is the purpose of medicine. When people become ill medicine ensures they return to functional state so they can become functional to society.
    - Being sick is detrimental to well-being of society as a whole. Assumption is you're not supposed to participate in society when sick, affecting society on small scale.
        - Doctor = help you get better so you can participate in society.
    - Medicine Institution stabilizes social system in emergency situations like hurricanes/earthquakes, etc. where hospitals/medical professionals provide medical assistance needed to injured.
        - Day-to-day, it improves quality of life for aging population to allow them to contribute longer to society.
- **Conflict Theory** – Inequality between different groups. Who has access to medical care? Wealthier people can pay for best medical care, the poor can't afford the deductibles/insurance so they skip hospitals, and are sick for longer/never get better.
    - Unequal access to valuable resources in society (education, housing, jobs) leads to heath disparities and limited access to medical care.
    - Power struggle between different interest groups can affect health of individual, ex. Factories (want lax regulations) vs. people living nearby (want strict). Asthma rates are higher with more pollution.
- **Social Constructionism** – we attach different meanings to different behaviours, and have preconceptions of different people (stereotypes)
    - We have preconceptions about different races, genders, and subcultures. Assumptions dangerous to medical profession – affect how you treat patient and their diagnosis.
    - "Poor people don't deserve healthcare because they don't work hard enough" BUT: Some people work hard @ minimum wage who can't afford healthcare but there are people who don't work who can.

    - There are stereotyped assumptions on both sides – patient may feel some symptoms aren't important enough to mention, or doctor makes false assumption based on how patient appears.
    - Can't declare characteristic of person based on circumstance, ex. people who don't work can still afford healthcare while those who work hard can't afford it.
    - **Medicalization** – patients/doctors construct illness out of ordinary behavior. [Not sitting still in class doesn't mean ADD]
- **Symbolic Interactionism**
    - **Doctor-patient relationship**, given meanings to lab coat/stethoscope can affect interaction. Important for doctor to realize the meaning the patient has given to tools of medicine; Ex. Lab coat is sign of authority. Stethoscope is a way to interact with patient.
    - **Changes in society** – recently, medicalization of society, where everything has a medical fix. Standards of beauty have made many undergo unneeded plastic surgery, or have C-sections. Normal behaviours are being shown as illnesses. Ex. Depression. (Sad is not depressed, sad is a natural biological function).
- **Feminist Theory** – medicine is still a male-dominated field, heads of doctors and hospitals usually men, and disparity in jobs/salary between the two. Translates into a disparity in power.
- **Rational Choice-Exchange Theories** – (people behave rationally in their best interest). What's purpose of medical system as a whole (to keep people healthy or a capitalist organization)? Or is it a capitalist competition to earn the most money?
    - People run every aspect of medical system and those people will make decisions that benefit themselves more than random sick stranger, may affect why people go to doctor or not. Some people avoid doctors if they don't think it will benefit them. Can cause something that could have been easily treated to become a larger problem.
    - Self-interested behavior of people in charge will trickle down and affect well-being of patients
- Outside these theories – where you live can affect your health (food deserts), and nearly impossible to get nutrition a body needs from only these sources. Only things that exist are fast food/snacks for example. Some neighbourhoods have no gyms/playgrounds.

Demographics

Demographic Structure of Society – Age

- Sociology looks at different age **cohorts** (groups), specifically at age groups/generations, because they all live through the same events in certain time.
    - Always-On Generation: 2004+ - debated
    - Generation Z – 1995-2003 (acronym: The kids who love their Sony xperia Z phones)

    - Millennials – 1980s-2000s (Generation Y) (acronym: Dats us!)
    - Generation X – 1965 – 1980 (The 70s loved Drugs (Xstacy))
    - Baby boomers: 1946-1964 is large population in US, now up to 60s. Grew up in post-WWII periods, currently leaving work force. Opening jobs for younger people also become reliant on families for support depending on financial status (10% of elderly live below poverty) (Acronym: Your dad was a baby too!! This one's common sense!)
    - Silent generation – 1925-1945 older than baby boomers born during Great Depression (Acronym: Your silent grandfather)
    - GI (Greatest) generation – 1901-1924 - oldest people alive today. Born first quarter of the 20th century (Acronym: Your great grand father)
- Because of new advancements in medical technology people live longer,
    - Estimated by 2025 that 1/4th of population will be >65 y/o
    - Currently, only 13.5%?>65
    - 65 is age when people retire (no longer contribute to the workforce).
- Can look at **dependency ratio**, an age-based measurement takes people <14 and >65 who are not in the labour force, and compares that to # of people who are (15-64)
    - Higher the ratio, more dependent people there are.
    - Living longer = older residents can contribute to workforce for longer time
- As we become older our body breaks down. We begin to get chronic illnesses and health problems (arthritis, dementia, hearing/visual impairments decrease quality of life).
    - Older people are 5x more likely to use health services than younger people
        - age affects what kind of healthcare elderly can get– discrimination on age/inequality in healthcare.
        - People living longer means improved global health.
    - Old age people will need healthcare professionals who specialize in old-age care and prevention of old-age diseases. They also need services like long-term care and age-friendly services.
    - Society to readjust expectations of old age. Elderly people are just as important to society/community as younger people. With correct encouragement, can still contribute to cultural, social, economical well-being of society (even after leaving workforce)
    - As people age, they are affected by the environment, but the environment is also effected by the elderly.
- **Life Course Theory** – aging is a social, psychological, and biological process that begins from time you born till time you die. a holistic perspective that calls attention to developmental processes and other experiences across a person's life
    - Biological process change as people live longer = affect social process.
    - Age-based expectations no longer apply as they used to as people live longer. (ex. 80 year old on ski slope or getting a master's degree).
    - "life course approach refers to a research perspective that considers how experiences from earlier in life affect outcomes later in life."
- **Age Stratification Theory** – suggests age is way of regulating behavior of a generation

- **Activity Theory -** looks at how older generation looks at themselves. Certain activities or jobs lost, those social interactions need to be replaced so elderly can be engaged and maintain moral/well-being
- **Disengagement Theory** – older adults and society separate, assumes they become more self-absorbed as they age. Separation allows for self-reflection. But considers elderly people still involved in society as not adjusting well, which is debatable.
- **Continuity Theory -** people try to maintain same basic structure throughout their lives overtime. As they age people make decisions that preserve that structure and use it to adapt to external changes and internal changes of aging.
    - Older generations continue to age and adapt and society has to adapt with them.
- With more older people we need more healthcare professionals and support services, but we also have a great social/cultural/economic resource is available to us.

Demographic Structure of Society – Race and Ethnicity

- [BOTH SOCIALLY DEFINED]
- **Race** – a socially defined category based on physical differences between groups of people.
    - Racial formation theory looks at social/economic/political forces that result in racially constructed identities.
        - Sometimes differences are real, but sometimes only defined by history.
            - Ex. In 1800 in US, people would be considered black even if they appeared white if they had a black ancestor.
            - All humans 99.9% identical – There is no genetic basis for race. But it is important on a social level.
    - In the US race is defined by skin color but hair color is irrelevant. Latin America race category in the US can be broken down to 5-6 races in SA.
- **Ethnicity** is also socially defined, not defined by physical characteristics like race, but these groups are defined by shared language, religion, nationality, history, of some other cultural factor. Less statistically defined than racial groups and definitions can change over time.
    - An ethnic **minority** can be absorbed into majority after 1-2 generations. A minority is a group that makes up less than half the total population and is treated differently due to some characteristic.
        - Ex. In 1900s, native born Americans did not consider Irish, Italian, or Jewish immigrants to be white. Interestingly, children of these immigrants were considered white because they were culturally similar and their skin color was used to determine their ethnic identity.
        - **Discrimination:** Unjust treatment of a category of people because they belong to the category
        - **Prejudice:** Preconceived opinion that isn't based on reason or experience. Discrimination often results from prejudice.

    - Not everyone in a group is the similar, there are always exceptions. We need to make sure not to **stereotype** – consider everyone in a group as identical. We can only look at statistical values which serve as guidelines/trends as we study the population.
- There are statistical differences between different races and different ethnicities
- Racial differences can cause drastic events, like genocide or population transfer (where group is forcefully moved from territory), inter-colonialism (minorities group is segregated and exploited), and assimilation (where minority group is absorbed into the majority).
    - Statistically, many differences between racial and ethnic groups in healthcare, education, wealth, income, birth rates, life expectancy, family etc.
        - Many Americans can't support healthcare which affects lifespan.
        - Minorities tend to have shorter lifespan because: limited access to healthcare, lower-income jobs (more danger in workplace), higher toxin levels in environment, and personal behaviors (drinking/poor diet)
    - *Equal opportunity in life/equal access to education* – in reality, different races are stereotyped for different jobs. Minorities are expected to have lower-paying jobs while majority are expected to have higher paying job.
        - Asian-Americans and Whites have more access to education than African Americans/Latin Americans.
        - Economic/cultural factors cause this difference in access to education. Society also maintains differences.
        - Economically: For, Latin/African Americans, cost of education can be quiet high because they statistically work lower wage jobs.
        - Culturally, starting a family is more important than continuing an education.
        - Society is structured so racial and economic subordination develops and is sustained. In order to get a higher paying job, you need a good education. So if education is not a priority, not available, or withheld because of discrimination – jobs available are low paying jobs.
    - Interesting discrimination is present in criminal justice system. More incarceration of minorities (when compared to whites)
        - Ex. Laws for similar offences vary drastically. Punishment for crack cocaine (cheaper, used by low income users) are tougher/harsher than powdered cocaine (used by rich, more expensive). Separates rich/poor (who are typically minorities). Poor get tougher sentences.
        - Higher unemployment and educational drop-out rates for society. Provides fewer options other than crime.
        - Percentage of minorities in jail is much higher than percentage of minorities in the US
- **Pluralism** encourages racial and ethnic variation.
- *Dominant groups have racialized minority groups* – Dominant group ascribes some racial identity to members of racial group they didn't identify for themselves.

Demographic Structure of Society – Immigration

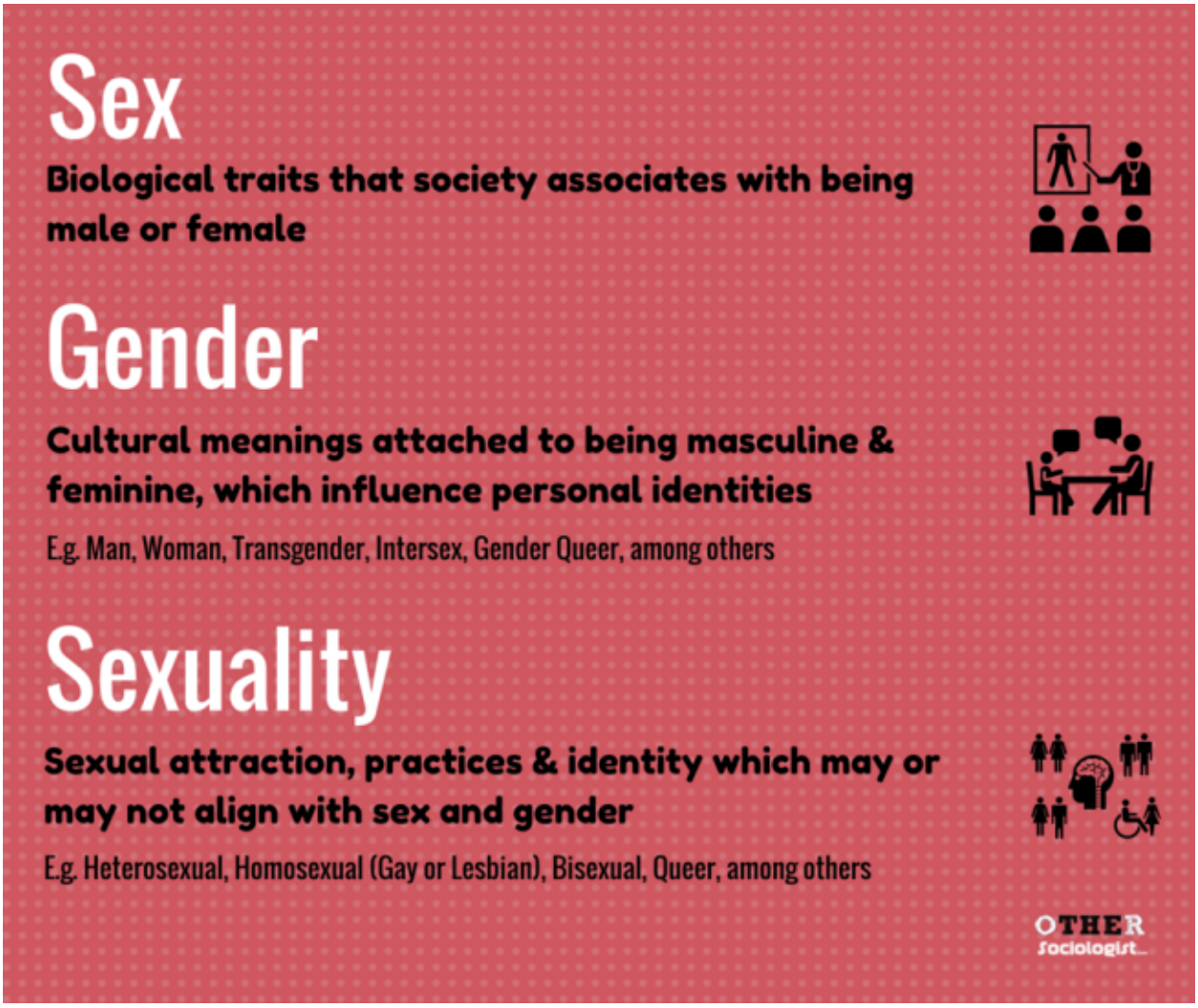
- **Immigrants** face severe challenges when arriving to a new country. People want to help them but are wary of their different cultures/customs of immigrants
- # of immigrants can put pressure on welfare capabilities (capability to promote economic/social wellbeing of citizens) of a country. Immigrants tend to move to industrialized nations like North America, Middle East, and industrial economies of Europe/Asia.
    - Immigrants can be functional to receiving country by alleviating labour shortages and the sending/origin country by reducing population (which alleviates strain on the economy that can't support such a large amount of people)
    - However, immigration can be dysfunctional as well. Immigrants can be exploited by countries which are interested in maximizing their profits while being unconcerned about global, social, economic inequalities that results from profit seeking.
- Immigration itself can cause problems
    - If too much immigration to one area, social services can't handle sudden increase in demand
    - Too many skilled people may leave their home country, can be harmful to the origin country
    - Fear/dislike of immigrants a different race than those of host country.
    - People immigrate for many reasons, often because of war, famine, or can't make a living in home country. Immigration sometimes to find better jobs and education.
        - Some people seek dual-citizenship to not be bound by one country
    - Transnational corporations take advantage of cheap labour to bring costs down and revenue up.
- Every country has own immigration policies, but often biased depending on where applicant is originally from.
    - Race and ethnicity tend to be the cause for biased policies and different expectations for people based on socially constructed group.
    - In 1986 US passed the Immigration Reform and Control Act, forbade hiring of illegal immigrants. But extended amnesty and legal status to illegal immigrants already there.
    - Some policies encourage families of immigrants to move, to keep money in local economy instead of immigrants sending them money.
    - European Union, residents in EU can live and work anywhere in EU. Economies become linked in EU.
    - Since 9/11 immigration more difficult, increased security checks for people wanting to move.

Demographic Structure of Society – Sex, Gender, and Sexual Orientation

- Sex, Gender, and Sexual Orientation are interconnected and important individually. All independent of each other.
- Media often portrays gender as binary – female vs. male Also portrays sexual orientation as binary – you like men or you like women.
- However, there's way more than 2 options. There are 5 considerations when examining people's gender and sexual orientation:
    - **Biological** – *sex* (male/female – the biological characteristics) person is born with. Are they male or female? (XY sex Chromosome, or XX sex chromosome). (More below)
    - **Identity** -*gender* (masculine/feminine – behaviors, roles, activities in society) they identify as (More below)
    - **Expression** - gender they express (More below)
    - **Attraction** - gender they're romantically attracted to (More below)
    - **Fornication** - gender they're sexually attracted to (More below)
    - **All of the above are a part of a person's identity and don't need to align**
    - **Sex**: Biological factor. XX or XY sex chromosome. Not binary. There are **intersex** people have 1 or 3+, so express different sex characteristics. Some intersex characteristics are born with both male and female characteristics due to unusual hormone levels.
        - More random detail on gender (not included in KA videos)
        - (XXY – Kleinfelter's or XO- Turners Syndrome (can occur in Meiosis I non-disjunction in spermatogonium and when that joins with a normal egg) [Sperm has XY or O]
        - Meiosis II nondisjunction can result in spermatogonium becoming spermatids with XX and or YY or O chromosomes, creating children that are XXX (triple X, super-females) or XYY (Jacobs syndrome – super males) or XO (Turner's Syndrome) if fertilized with normal egg.
        - Kleinfelters is male that are female like, Turners = females that are short
    - **Gender** – a social construction theory that states that gender it is not a fixed or innate fact, but instead it varies across time and place. Categories of gender are fluid and subject to social process of meaning-making. Has two main factors – gender **identity and expression**. Many possible combinations, ex. someone biological male and identify as male (**cis-gender**- same biological sex and gender identity), or identify as female (**trans-gender –** biological sex and gender identity don't match). Cis-gender male can express a socially male (abide by strict male guidelines) or female appearance (follow social female guidelines like wearing dresses/makeup). Same options for biologically female and intersex people.
        - **Gender** also not binary some people are **gender queer** (don't identify as either male or female), and can present (gender expression) as gender queer or male/female.
            - **Agender** – rejecting gender categories

        - **Gender fluid** – moving across genders
        - **Non-binary** – not identifying w/ any specific gender
        - **Third gender** – cultures that recognize non-binary gender
    - Western world – you are born male or female and from moment you are born (and sometimes even earlier) society gives them messages (**gender roles –** proper behaviors, attitudes, activities of males and females) on how should they behave and think. Boys should be masculine and females should be feminine.
        - Gender Role: A **gender role** is a set of societal norms dictating what types of behaviors are generally considered acceptable, appropriate, or desirable for a person based on their actual or perceived sex.
        - **Gender norms** (the socially acceptable ways of acting out gender) are learned from birth through childhood socialisation. We learn what is expected of our gender from what our parents teach us, as well as what we pick up at school, through religious or cultural teachings, in the media, and various other social institutions.
        - Girls: emotional, soft, submissive
        - Boys: aggressive, tough, dominant
        - Media tells us what we should be. Societal norms are everywhere. Try spitting in public as a female or knitting on the bus if you are male.
            - Worse for male to act feminine than female to ask masculine
            - Feminine roles (ex. taking care of a family) don't have same values in society as masculine roles (ex. succeeding in a job).
            - Working mothers considered ambitious, people wonder why father would stay at home and raise kids.
- **Sexual Orientation** – (**attraction and fornication**). Not dependent on sex OR gender of a person. You can be attracted to any gender but only have sex with females, or any combination. You can be attracted to no gender.
- Stereotype norm is **straight** (biologically female, identify and present as female, and be attracted to only males and have sex with only males).
    - Is sexual orientation a choice – Been debated for many years. Is there a genetic basis? Is there a "gay gene"? No answer. Even if there is, does that make their love any less real? What if person with gay gene likes people of opposite gender, or if someone without gay gene likes person of the same gender.
    - Discrimination based on gender/sexual orientation happens all the time
    - Is homosexuality a choice or genetic? If it is genetic, sexual discrimination is as societally dysfunctional as discrimination based on race, gender, or

disability-based discrimination. If it isn't and is a choice/social construction, still equally bad because race itself is a social construction.
        - Restrictions on rights of homosexuals – ex. marry or visit partner in hospital.
- Many differences between men and women, discrimination, pay (woman paid less), expected roles.
    - Ex. Some differences: Success in school – hard work in girls, intelligence in boys. Woman who priorities job – looked down on, men are congratulated.
    - Men more likely to live a shorter time than women -men take more risk or maybe due to biological factors. Men are more likely to get heart disease (occupy high stress positions which increased risk of heart problems) while women more likely to have psychological illness.
        - Societal expectations affect problems that are reported and where people seek help. Ex: Weak for man to have depression/anxiety
    - Society reacts differently based on person's gender and also their sexual orientation. Restriction on rights of homosexuals (right to marry or visit partner in hospital).
    - Discrimination for each type/person


Sex
Biological traits that society associates with being male or female
Gender
Cultural meanings attached to being masculine & feminine, which influence personal identities
E.g. Man, Woman, Transgender, Intersex, Gender Queer, among others
Sexuality
Sexual attraction, practices & identity which may or may not align with sex and gender
E.g. Heterosexual, Homosexual (Gay or Lesbian), Bisexual, Queer, among others
OTHER sociologist

- "Social and cultural factors affect different health outcomes between males and females. Unintentional injury often occurs from behaviors that are patterned according to gender norms. For example, males are more likely than females to engage in risk taking activities that can lead to injuries. This difference is rooted in social and cultural factors more so than in purely biologic causes"

Demographic Structure of Society Overview [Lots of repeat to above but a new KA video]

- Different ways you can look at population of group. Groups you can put society into to look at trends and statistic (ex. Education levels and death levels for different age groups or races or ethnicities. Statistics for immigrant's vs native born, of people of different genders, sexes, or sexual orientations). We look at statistics for jobs, money, income, education, quality of life, access of healthcare (factors that affect the individual). Split population into groups and compare their lives. Always exceptions.

- **Age:** Based on age different cohorts. Each generation have similar events and time periods. Elderly people have harder time having health insurance (pre-existing conditions, more likely to sick). 65+ age group growing, people are living healthy lives for a longer period of time and can work for longer period of time. Aging is more than just a number. Age can be just a regulator on behavior. Global health improvement = older people are valuable in society
- **Race + Ethnicity (more common): Race:** social construction that puts people into groups based on observed or perceived differences in physical traits
    - "ethnicity is defined by culture (culture and ancestry) whereas race is defined by perceived physical characteristics" Both are complex, social categories that change over time, rather than simply biologic features of human beings.
    - **Racial formation theory:** looks at economic, social, political factors that results in socially constructed races. In US: White, African American, Latin American, and Asian groups.
        - **In South America:** Latin American is broken down into more groups
    - **Ethnicity:** Groups people on shared language, history, or nationality.
    - Race and ethnic group definitions can change over time as value of a society changed.
        - **Racialization:** Racial identity ascribed to a minority group
    - Statistical differences between racial and ethnic group.
        - Racial and ethnic groups (except Asian Americans) have bigger families, less access to healthcare, higher incarceration rates, lower paying jobs, and higher school dropout rates. Most differences due to education.
- **Immigration:**
    - **Discrimination**: Unjust treatment of a category of people because they belong to that category. Some discrimination based on race/ethnicity. Immigrants face this in their host countries. Immigration is easier for some ethnicities than for others.
    - Citizens of host countries fear change that immigrants carry with them. Immigrants can overtax social services if too many people move in the same time and also can cause job shortages (but they can provide jobs in fields that native citizens do not wish to do. Immigrants are not as picky).
    - Immigrants move to industrialized countries (NA, middle east, Europe, asia)
- **Sex, gender and sexual orientation**
    - Discrimination also between men and women and people lives in general.
    - Essential part of any society
    - Sex: biological determination of male/female/intersex people (1 or 3, 3+ sex chromosomes)
    - Gender: social construction on how a person of a specific sex should behave
        - Each person has gender identify as and the gender presented to society
        - Assumed roles men and women have in society. Female should act as women, Males should act like men

- Sexual Orientation: Socially constructed grouping. Two parts: gender you are attracted too and the gender you have sex with
  - Men are supposed to be attracted to women, women are supposed to be attracted to men. People don't necessarily follow this today.
  - Fear of change = cause discrimination of minority groups
  - **Minority group:** treated differently because of some cultural or physical characteristic. Less than 50% of population.
  - **Women:** > 50% population but treated as a minority. [Lower paying jobs, lower expectations]
  - **Men:** there is a narrow definition of masculinity that they are "allowed to be"
  - Sexual orientation Discriminations in jobs and healthcare.
  - Social constructed ways one should be limits every individual!

Not in KA video but important to know:

- **Gender schema** theory – Theory that explains how individuals should be gendered in society. How sex-linked characteristics are maintained and transmitted to other members of a culture. What constitutes men/female characteristics and how stereotypes become ingrained in the society. Cognitions regarding what constitutes a sex identity is a gender schema.
- **Gender script** – what we expect men and females to do. Gender Script: organized information regarding the order of actions that are approximate to a familiar situation.

Urbanization

- **Urbanization** is movement of people from rural to urban areas.
- **Rural** is anywhere with <1000 people per square mile (ex. Farm country or Alaska). Has to have less than 25,000 residents.
- **Urban** areas include cities/towns with >1000 people per square mile.
  - **Cities** have over 50 000 people.
  - **Metropolis** have over 500 000 people.
  - If many metropolises are connected, called **megalopolis** (ex. Urban complex of 44 million people in NYC area from Boston to Washington DC).
- Three theories of cities. Cities are sites of culture, but also host to more crime. According to conflict theory, they're sources of inequality. From symbolic interactionism viewpoint, cities are places where people can get different perspective of looking at life.
  - Functionalist perspective: Cities have important functions and have a slice of culture and diverse populations but also host to crime and other disruptions to society.
  - Conflict Theory: Source of inequality that are entertainment centers for the wealthy. Political and economic elite run the city to increase personal resources while taking from the poor.
    - Diversity of culture and social backgrounds increases conflict on beliefs/values.

- Symbolic Interactions Theory: Cities are places where people have different ways of looking at life. Strong cultural values, people have strong cultural values and people have different interactions and perspectives of urban life.

- Why people move to urban areas?
  - Began during Industrial Revolution, losing jobs on farms due to machines/technology in industrialization. People had to move to cities to find work/housing = urban areas grew.
  - Improved utilities (power, water, transit) and building.
  - Today: more job opportunities, and more options/services for education/healthcare/etc.
  - Today there is an increasing population so people need to move to cities to find places to work/live because there isn't enough land for everyone to farm.
  - Pros of a city: wide variety of culture, anonymity in a big city
  - Cons: **Crowding** can occur in cities. Too little space/too many people. [Some cities can have high density and not feel crowded]
    - Less sense of belonging in a city when compared to a town, so we join groups to form communities (yoga, sports bar, dance club)
  - Individuals fall into categories based on what connections they are looking for in a city and what communities they form.
    - **Cosmopolites**: drawn to city due to cultural benefits and convenience.
      - **Ex**. Students, artists, entertainment, and intellectuals
    - **Singles**: Looking for jobs, partners, entertainment
    - **Deprived/Trapped**: Can't afford to leave city.
      - Ex: unemployed, elderly, homeless, poor (Just make enough to get by but not enough to collect money to leave the city).
    - **Ethnic Villages:** Native culture brought here when the people who live here immigrate. They settle together with people of similar backgrounds and create a community that looks like their home.
      - Ex. Chinatown/Little Italy.
    - Sometimes, communities are planned into design of an urban area.
      - Urban villages are designed so the residence who live there can work, reside, and recreate in the same area
      - Promote biking/walking because things are so close.
      - Facilitate community interactions because people are walking, living, working near each other.

- **Suburbanization** is movement away from cities to get a larger home (American dream), but commute for work can be long and harder to get quick medical help. However, suburbs form their own economic centres and become independent to cities they border. Ex. Silicon Valley created on outskirts of San Jose by tech-companies.
  - Often, no planning of suburbs (don't turn out as well as they could have and there becomes an "urban sprawl" like in Atlanta

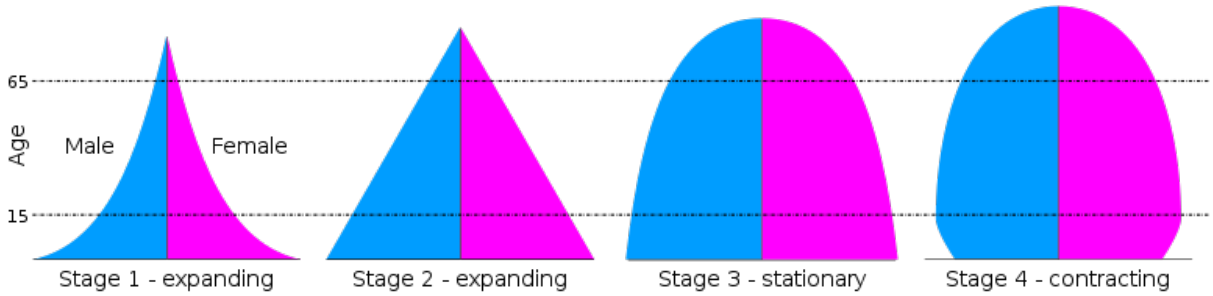
    - **Urban Decline:** As people move out of city centers, city can fall into disrepair. Buildings abandoned, unemployment/crime rises. Population of city declines.
- **Exurbs**: Beyond suburbs, prosperous areas outside the city where people live and commute to city to work, like suburbs.
    - **Ex**: Rochester outside Detroit, Michigan and Woodlands near Houston, Texas
- **Urban renewal** – revamping old parts of cities to become better. But can lead to **gentrification**, which means when redone they target a wealthier community which increases property value. People there before are pushed out because they can't afford property anymore and it leads to great inequality in cities.
- **Rural rebound** – people getting sick of cities and moving back out to rural areas. People who can afford to leave the city and looking for simpler/slower life. Happens close relatively near to urban centers so residences have convenience of a big city.
    - Often people move to scenic rural areas
- Recap: Movement of people from rural areas to urban. Effects people who live in cities and how cities develop. People seek new ways to find community and enjoy freedom/benefits of city life and face difficulties/dangers. Urban development spread outwards from economic centers and form new economic centers and merge with nearby cities to form massive urban areas linked geographically, economically, and socially.
- A **slum** is a heavily populated urban informal settlement characterized by substandard housing and squalor.[1] While slums differ in size and other characteristics from country to country, most lack reliable sanitation services, supply of clean water,
- **Ghettoes** are defined as areas where specific racial, ethnic, or religious minorities are concentrated, usually due to social or economic inequities.

Population Dynamics

- Looks at how population of a country/region/world changes - factors that increase/decrease a population to create a total growth rate.
- 3 factors contribute to total **growth rate**: fertility, migration, mortality
    - **Fertility** is natural ability of human beings to have babies, which add to the population. **Fecundity** is the potential reproductive capacity of a female.
    - **Migration** is number of people moving permanently (to live, work, and eventually die) into/out of countries. Doesn't change total people on planet but does change # of people living in a region/country.
        - When going on vacation does not equal migration.
    - **Mortality** is death, decreases population.
- To measure the above three factors, we use rates (# of people who are born, people who move in/out of a different country, and # of people who die in a certain period of time). Usually measure birth, migration, and death rates over a years' worth of population change because enough time where an obvious change is visible but not too much time where we miss trends in how the population changes. Measure rates over **1 year**, and per **1000** people so rates are comparable and easy to understand. [Ex: 18.9

births/yr per 1000 ppl is easier to grasp than 134M births/yr worldwide …easier to compare country birth rates when scaled. Mali = 700K/yr doesn't seem like a lot but the rate is 46 births/1k people which is twice the world average]

- What affects population changes/growth rate: [Fertility, migration, mortality]. Migration does not affect population growth of the world, but effects that of a country.
    - Increase: **Births** and **immigration.**
        - **Immigration:** movement of a person into a country. #ppl moving in/1000
        - **Birth rate:** Births/1000 people per yr. Can also look at births in terms of **fertility rate**- # number of births a woman is expected to give birth to in her child bearing years. On avg women in US gives birth to 2.1 children in her life**.**
            - >2 = increase in population
            - = 2, no increase/decrease in population.
            - <2 = decrease the population
        - Total Population Increase Rate: (#Births + # Immigration)/1000. Multiply Rate by population and you get the population increase
    - Decrease: **Death** and **emigration**. Can calculate mortality rate by age group, or country.
        - **Emigration**: opposite of immigration. Movement of a person out of a country. # ppl moving out/1000 ppl.
        - **Death (Rate)/Mortality Rate**: #Deaths/1000 people.
            - High Mortality rate DOES NOT mean lots of young or unnatural deaths.
            - **Population Pyramid**: Graphs the age and sex distribution of a population. Males/Females on x-axis and increasing age on y-axis.
            - Stationary/Constrictive Pyramid: Indicate low birth and death rates in population.
                - Constrictive period = fewer young people than old people. (in developed countries). Mortality rate of country with lots of old people does not compare well with a country where people are dying young from disease.
            - Expansive Population Pyramid: High birth rate and high death rates.



        - Age specific mortality rate is a better indicator. Elderly mortality rates between different countries or mortality rates between 20-24 yr olds or 45-49 yr olds.
            - More info from age-specific comparisons.
            - **Life-Table/Mortality Table:** when you break mortality rate by age. Tells you probability someone will die given their age which can vary from country to country.
            - When looking at population of a country, all-encompassing mortality rate is sufficient.
        - Total Population Decrease Rate: (#death + # Emigration)/1000. Multiply Rate by population and you get the population decrease
    - Net Migration: Immigration – Emigration (# of people entering - # of people leaving a country)
        - Migration reasons: People are moving to industrialized countries for potential for better life. Move for political reasons (become refugees), for jobs, or wanting to live somewhere foreign.
        - **Internal Migration:** move within same country. Doesn't change population of a country, but can effect economics/culture of a country. Internal migration is a large factor in urbanization (movement from rural to urban areas)
    - **Growth rate:** How much population of a country grows or shrinks over a period of time. It is not always a positive number. While world population grows, growth rate of some countries is negative.
        - Growth Rate: (People added to population – people removed)/(Initial Population) *100= (Total Population Increase – Total population decrease)/(Initial Population)*100= (Births + Immigration – Deaths – Emigration)/(Initial Population)*100 [Can be calculated as Current Population – Initial Population / (Initial) * 100]
        - Most countries have a positive growth rates currently.
        - Positive Growth rate = BIGGER population now than before
- **Current Population:** Initial Population + Births – Deaths + Immigrating In – Emigrating out [If this is a negative number, you have a negative growth rate for that country]
    - Currently, world population is growing.
        - ~7B current population of world
        - We estimate/extrapolate data of population!

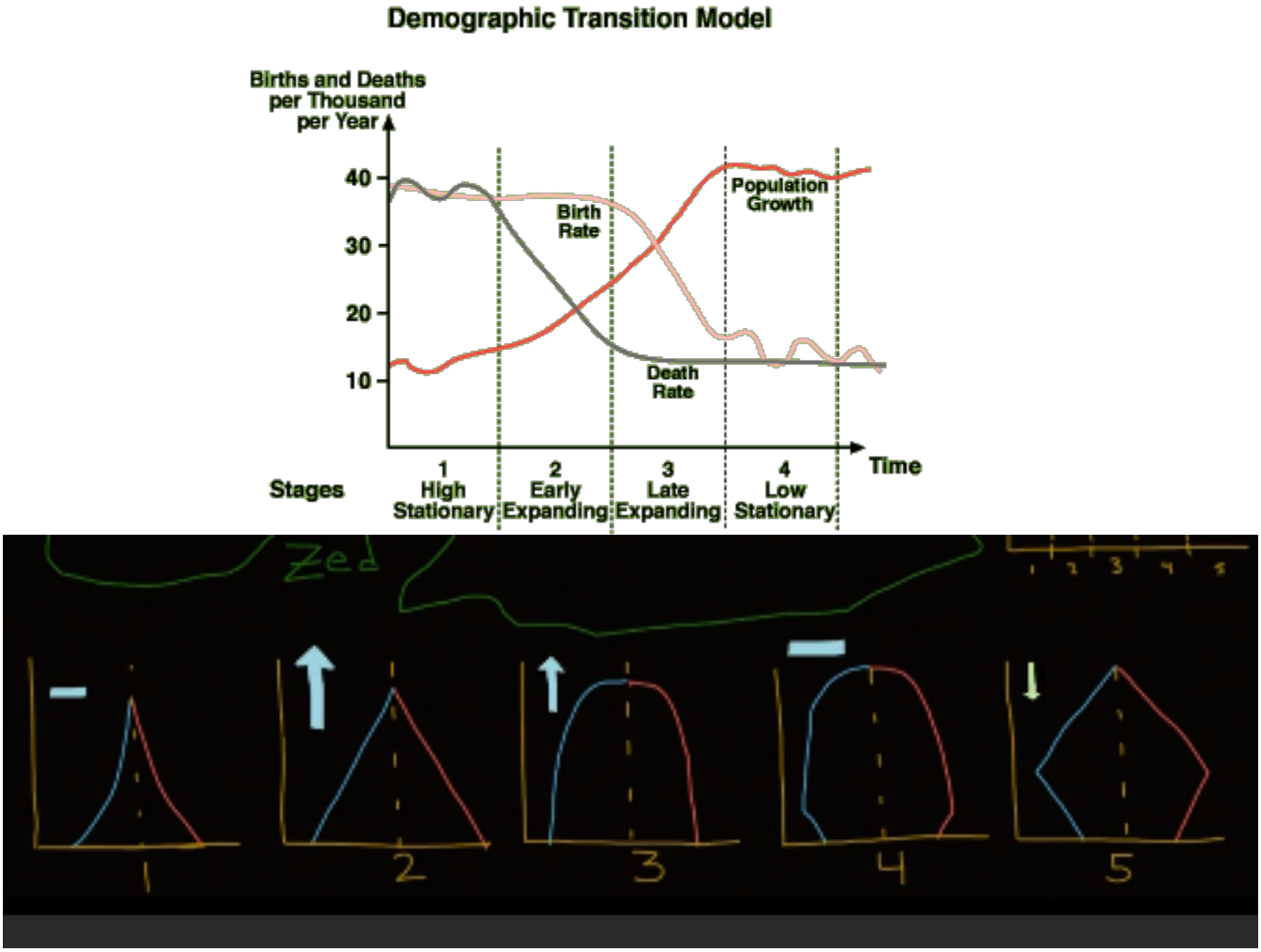
Demographic Transition (some material included above under growth rate)

- **Demographic transition** is a model that changes in a country's population – population will eventually stop growing when country transitions from high birth/death rates to low birth rate/death rates (fertility/mortality) which stabilizes the population
    - This stabilization often occurs in industrialized/developed countries.

- When immigrants travel to developed countries, they affect demographic transition of the country by increasing fertility and decreasing mortality (often healthier people migrate).
- "Refers to a theory of economic development and population change. The theory suggests that economic changes, specifically industrialization affect the relationship between the fertility and mortality rates in a society. Population growth occurs rapidly because the mortality rate falls before the fertility rate does. Over time, the fertility rate also falls, thus stabilizing a lower rate of population growth.

- Growth rate is positive because:
  - Economic benefits …children can work to support family
  - Sometimes, Government provides economic incentive to families who have children (ex. Japan where birth rates are low)
  - Religion influences population growth (promotes large families – increases # of people of that faith and also promotes stronger community). Some religions forbid use of contraceptives by followers.
  - Cultural influences of large families: children means you get to pass down family traits and values. Prestige of having children
- **Demographic transition Model - 5 stages:**
  - **Stage 1:** *High birth rates* due to limited birth control, economic advantage for more workers, and *high death rate* due to disease/poor nutrition. Most countries at this stage prior to 18th century when death rates fell in Western-Europe. Large young and small old population. *Overall population remains fairly stable*
    - Pyramid Model: Stationary Pyramid. Large young population and small old population (y axis)
  - **Stage 2:** Seen in beginnings of developing populations/countries. Population rises as *death rate decreases/lower death rate* (availability of food, improvement in health and sanitation). Trend was seen in 19th century Western-Europe after Industrial Revolution. *High birth rates remain. Overall population growth.*
    - Pyramid Model*: Early Expanding Population Pyramid.* High birth rates and death rate declining so you get a nice pyramid shape.
  - **Stage 3:** *Death rates continue to drop and birth rates begin to fall*. Ex. Middle East. Population continues to grow
    - *Birth rates fall* because of birth control, social trend towards smaller families.
    - *Death rate drops because* Society has better healthcare,
    - Occurs in countries that are becoming more industrialized (fewer childhood deaths, and children no longer needed to work or not allowed to work by law – no longer economically beneficial to have children). In this stage children are sent to school instead of working to support the family.
    - Slower population expansion and longer lived elderly.

        - Pyramid Model: Late Expanding Population Pyramid. Birth rates decline (fewer young people) and people are living longer lives as people are getting older.
    - **Stage 4:** Population stabilizes, *both birth and death rates are low* and balance each other out. Population is large because it has been growing until Stage 4.
        - Low Birth Rates: improvement in contraception and high percentage of women in workforce. Many Couples focus on careers over children. Ex: US/Australia
        - Pyramid Model: Low Stationary Pyramid. Low birth rates and low death rates (longer life expectancy)
    - **Stage 5:** Speculation. World population will be forced to stabilize.
        - **Malthusian Theorem** suggests: Run out of resources, global food shortage. We won't be able to maintain natural resources for everyone on planet. (high mortality rate)
            - Current: 1B suffer from malnutrition already in world of 7B
        - Lack of resources will lead to public health disaster and force population to stabilize– stabilize and then negative growth rate. Negative growth rate would occur when population forced to finally have lower birth rate than death rate.
        - Pyramid Model: Constrictive. Fewer young people than older people.
            - Due to rise of individualism
            - **Anti-Malthusian Theorem**: Couples only want to have one child or have children later in life. (low birth rate)
            - Better standard of living = smaller families because children are economic burden. Also, industrialized nations have better education/access to healthcare which contribute to reproductive choices. China have government policies to slow population growth to preserve their resources.
            - *Growth rate can INCREASE as well!* Some evidence - Higher standard of living promote fertility and higher birth rate.
    - *Summary:* Demographic transition shift from high birth and death rate to low death and birth rate as country becomes industrialized. What happens in stage 5 is hard to tell?



Globalization Theories

- **Globalization** is the sharing of culture, money and products between countries due to international trade and advancements in transportation and communication. Social process where people become more aware of cultures of people across geographical, political, and social borders.
    - Contributors to globalization: Economic interdependence between countries, advancements in communication technology, technology in general
    - Globalization allows for: international terrorism, civil unrest, foreign cultures integrated in each country, world-economy where countries become interdependent (global community)
- Not recent – ex. 1st century BCE Silk and Spice Trade Route in East Asia (Linked economies and introduced cultures)…English/Dutch shipping empire in 16th century
- **World-Systems Theory** – importance of world as a unit rather than individual countries. Divides world into 3 countries: core, periphery, and semi-periphery.

- **Core** = Western Europe and US. Strong Central Government with enough tax to support it. Economically diversified, industrialized, and independent of outside control. Strong middle and working class. Focus on higher scope production of material goods rather than raw materials.
- **Periphery** = Latin America and Africa. Relatively weak government, greatly influenced by and depend on core countries and transnational corporations. Economy focused on narrow economic activity (1 type usually) like extracting raw material. High percentage of poor/uneducated people and strong upper class that controls most of economy. Huge inequalities.
- **Semi-periphery** = India and Brazil, middle-ground between core and periphery. Not dominant in international trade but diversified/developed economy. These semi-periphery countries can come either from periphery countries moving up to core countries or core countries declining towards periphery status.
- It is a fluid-model but *criticized* on being too focussed on core countries and economies and ignoring class struggles and culture of individual countries.

- **Modernization Theory** – all countries follow similar path of development from traditional to modern society. With some help traditional countries can develop similarly to today's developed countries did.
  - Looks at internal social dynamics as country adapts to new technologies
  - Looks at political and social changes that occur during adaptation as well.
- **Dependency Theory** – Reaction to Modernization theory. Uses idea of Core + Periphery countries to look at inequalities between countries. Periphery countries (3rd world countries) export resources to Core countries (first world). This is not because they are in an earlier stage of development but because they have been integrated into the world economy as an undeveloped countries. They don't have means to become a developed nation. They will remain poor and dependent on wealthier nations.
- **Hyperglobalist Perspective** sees globalization as a new age in human history – countries become interdependent and nation states themselves are less important. Countries become one global society. Theorists don't agree if this good or bad. Driven by a legitimate process.
- **Skeptical Perspective** – critical of globalization, considers it as being regionalized instead of globalized. Third world countries aren't being integrated into global economy with same benefits as first world countries. Current economy is not leading towards global capitalism. Transnational corporations still tied to their home countries and national borders remain important. CRTIICAL.
- **Transformationalist Perspective** - doesn't have specific cause or outcome. Believe national governments are changing, perhaps becoming less important but difficult to explain change so simply. They see the world order is changing. Just a new world order is being developing. Many factors that influence change of world patterns but outcome unknown. CHANGING

Globalization – Trade and Transnational Corporations

- **Globalization**: We live in a global community not limited by physical boundaries. People connected by internet, ease of travel, communications. People, money, ideas, services, goods, information are moving between countries which causes cultural and economic changes in countries.
    - Technology has allowed for increased possibilities of international grade and exchange.
- Increase in Trade has been created and supported by international regulatory groups like World Trade Organizations, and transnational agreements like the North American Free Trade Agreement. No country completely independent (all depend on international trade for own prosperity)
    - Without international trade, no need for groups. Without groups trade would be impractical at today's scale. The trade regulatory groups regulate flow of goods and services between countries, reduce tariffs (taxes/imports), and make customs easier and make trading across borders more feasible.
    - Agreements often benefit **private industries** the most.
- Companies that extend beyond borders of a country are called **multinational/transnational corporations** (T&Cs).
    - These T&Cs Cross borders to take opportunities they can find in different countries to manufacture, distribute, market, and sell their products.
    - Ex. McDonalds, Coca Cola, General Electric, Ford Motor Company. GE based in US but has half of business and employees working in other countries. [Most of these market themselves as American companies].
    - Some T&Cs have more weight than entire nations – influence economics/politics by donating money to specific political campaigns and lobbyists, and influence global trade laws of regulatory groups.
- Globalization has 2 major impacts on country – on **economy and culture.**
    - Much of **economic globalizatio**n results from global market competition for cheap labour, and locating factories in cheapest locations.
        - Developing nations provide incentives like tax-free zones or cheap labour so T&Cs can bring jobs and industry to agricultural areas. [This allows for rapid advancement of the developing nation because of ideas/innovations they bring from developed world. Makes nations around the world more interdependent which minimizes conflict]
        - **Negatives of incentive**: Workers abroad exploited (wages are cut, prohibited from unionizing, sweatshop conditions – long hours, substandard wages, poor working conditions) in host-country and **outsourcing** (made possible by globalization) can hurt core country (more unemployment).
            - Side note: If labor laws become too restrictive in one country – they move their factories to a new country which leaves unemployment in country they moved from.

        - Outsourcing leads to greater profits for company (lower wage workers in other countries) and more employment in host-countries.
        - Free trades Give these T&C companies autonomy and influence in politics, and allow workers to be exploited.
    - **Positive:** Better allocation of resources, higher product output, more employment worldwide, cheaper prices. Benefits for all countries involved in free trade.
        - Free-Trade also encourages cultural practices/expressions to be passed/spread abroad from group to group– **diffusion** (ideas and practice spread from places where they are well known/apparent to places where they are new and not often observed). Technology (mass media/internet) has made it easy for diffusion. Most commonly seen in spreading of NA culture and transfer of scientific innovations.
        - Upper class of host-country can benefit by business of T&C

Social Movements

- When a group of people come together with shared idea, can create lasting effects by encouraging/resisting change in society which both play a role in shaping future of society.
- Social movement need **organization, leadership**, and **resources** to gain momentum make an impact. [A small group with an idea is not a social movement]
    - How to form a social movement: Group with strong shared idea that has resources/leadership to survive that make an impact.
- **Activist movements** aim to change some aspect of society, while **regressive/reactionary movements** resist change.
- Several theories of social movements form:
    - 1. **Mass Society Theory** – Scepticism about groups that were involved in social movement, said social movements would only form for people seeking refuge from main society. Ex. Nazism, Fascism, Stalinism (social movements in 20th century that destroyed millions of lives). [People who joined social movements were dysfunctional, irrational, and dangerous]. Theory did not persist. People only join to satisfy a psychological need for involvement.
    - After 1960s and Civil Rights movement different theories came to light.
    - 2. **Relative Deprivation Theory** – actions of groups oppressed/deprived of rights that others in society enjoy. Ex. Civil Rights Movement, a response to oppression to people of color in US.
    - **3 things needed for social movement** to form:
        - **1. Relative deprivation**: Those who join social movements are not necessarily worst off. What's important is how people perceive their situation. [Ex. Someone making 100k can be not happy while someone

making very little can be happy]. Feeling of discrepancy between legitimate expectations and reality of present.
        - **2. Feeling of Deserving better**
        - **3. Conventional means are useless –a** belief conventional methods are useless to get help.
        - Criticisms: people who don't feel deprived join social movement even if they don't suffer themselves. And too risky for oppressed to join a movement due to lack of resources to participate (can't take time off work...but there is exceptions to this). Also, when all 3 are present, no social movement created.
    - 3. **Resource Mobilization Theory** – looks at social movements from different angle. Instead of looking at deprivation of people, *focuses on factors that help/hinder a social movement like access to resources.* Gathering together people of a shared idea is not allowed everywhere. Also, for a social movement you need money, materials, political influence, media, and strong organizational base to recruit members – charismatic figure needed (unite people/members/oppressed on a single idea) Ex. Martin Luther King Jr. in Civil Rights Movement (beacon to oppressed black population and gained support he needed.
    - 4. **Rational Choice Theory** – people compare pros and cons of different courses of actions and choose the one they think is best for themselves. These choices shape pattern of behavior in society.
        - Have to assume a lot for this to be true: 1. all actions can be listed in order of preference and all preferences are transient. [Ex: I like Apples better than pears and pears better than bananas, so I like apples better than bananas] 2. Also assumes person has full knowledge of outcomes due to action and 3. people have ability to weigh different actions. Rarely all true.
- Social movements can affect people not involved in them.
- Social movements can cause widespread panics (unreasoning fear – such as anti-vaccine movement), crazes (fads, ex music, dieting).
- Social movement Stages:
    - 1. begins with shared idea shared by a few,
    - 2. **incipient stage** - public takes notice of the situation that they consider to be a problem
    - 3. People begin to organize in a group and raise up
    - 4. They will either succeed in changing the society or have to adapt. In the end, they become part of bureaucracy they try to change. If they are successful, they become absorbed into institutions once desired changes have been achieved. If failed = they are not active anymore but leave a mark on society/culture.
        - Our culture and society is formed from past social movements. Even failed social movements leave a mark. [Ex: Martin Luther movement against Catholic Church resulted in Protestant Church, Martin Luther King

Jr. social movement against segregation that led to civil rights movement, and Nazism left a lasting mark on world politics].
    - In their time: social movements seem radical, farfetched and extreme but now we except their goals. (Ex: every person now has rights to freedom and equality)

Overview of Demographics

- **Urbanization**: movement of people from farms to cities.
    - Functionalist perspective: cities are good and bad for a society. They are centers of culture/diversity and crime
    - Conflict theory: sources of inequality where the elite use the poor for their resources to enrich their own lives. Cultural diversity leads to conflict between different beliefs and values.
    - Symbolic Interactionism: cities of hubs of cultures with strong norms and values
    - Reasons to move to a city: Jobs, better utilities, easier access to hospital/schools,
    - People moving: affects people who live there. You need to join small communities to make friends/connections. Some people need to move away from cities (but not to a rural environment) – so people move to outskirts of city (suburbs) where people can form communities with their neighbors while maintaining individuality.
    - **Exurbs**: beyond suburbs who are very prosperous.
    - Drive to city for work can be tiresome so some suburbs create their own economic centers.
    - Some people rebuild areas of city called urban renewal which can lead to gentrification (former lower income residence forced out)
    - Rural rebound: some people desire to get away from urban areas and move back to rural areas.
- **Population Dynamics**: How population grows and shrinks over time. Looks at fertility, migration, and mortality rates. We look at years' worth of population change at a time.
    - Fertility: Rate people are born into a population. Increase population
    - Migration: two factors – emigration (moves out, lowers population) and immigration (move in, adds to population)
        - Reasons for migration: Refuge, work, live in a different countries.
    - Mortality: rate at which people are dying. Deaths decrease population
        -
    - Look at population pyramid to look at population of a country.
        - X axis – gender and y-axis age. Looks at # of people of each age group there are.
            - Expansive pyramids: lots of deaths and lots of births. Lots of young people not many old people
            - Stationary pyramid: Birth rates and death rates are low. Lots of everybody

            - Constrictive pyramid: low birth and death rates. More old people than younger pyramid. (in very developed countries)
    - Growth Rate = Initial Population + births + immigrants – emigrants – deaths = New population
        - If new population > old population = growth. Growth rate positive
        - If old population > new population = negative growth. Growth rate negative
        - Most countries growing but Bulgaria and Czech republic are shrinking
        - Fertility and immigration increase population while death and emigration decrease the population.
- Demographic Transition: model of changes in countries population. High birth and death rates transition to low birth and death rates
    - 5 stages:
        - 1. High birth and death rates. Stable population. High Stationary Pyramid
        - 2. High birth rate and declining death rates (better sanitation and food supply). Increase in population. Population of older people increases. Early Expanding Pyramid
        - 3. Lower birth rates (contraceptives, and social values changing) and sometimes continued decline in death rates. Population stops growing as quickly. Late expansive pyramid
        - 4. Birth rates and death rates balance. Population stabilizes. Lots of people because of all the growth in 1-3. Low-Stationary Pyramid
        - 5. Speculative Stage; population could remain stable, increase, or decrease (decrease=constrictive pyramid). Less births and more deaths.
    - Models changing population of country or the world
- Globalization: Sharing of ideas, cultures, services, and products across national borders due to progress of technology, interdependence of countries, and advancement in communication technology
    - People migrating to different countries or working in different countries bring their customers and cultures with them
    - **World Systems Theory**: World is a single social unit divided into three regions – Core countries: independent of outside control, industrialized | periphery countries: influenced by core nations and transnational corporations, dependent on one type of economy | semi-periphery countries: middle ground between core and periphery consisting of declining core country or rising periphery countries.
    - **Modernization Theory:** every country has similar path in development from traditional to modern and todays third world countries can reach same development as todays first world countries with help over time
    - **Dependency Theory:** Reaction to modernization theory and states that third world countries have their own unique structures and are poor and remain so because of their poor and unfavorable economic position in world economy
    - **Other theories: look at culture, social networking, economies, goods**

- **Hyper-globalists:** individual countries become less important as countries become interdepend and global society takes presence.
- **Skeptics** believe that world is becoming regionalized not globalized. (transnational corps are still tied to their home countries)
- **Transformationalists:** national governments importance changing, and world order design changing as well.
- Transnational Corps: looking across borders for cheaper materials and labor. Some make more cash in a year than some countries.
- Countries become less self-dependent and interconnected and there are both positive and negative effects of globalization.
  - Negative: countries competing to provide cheapest labor to Transnational corps
  - Benefits as well
- Globalization affects culture and economies of every country with foreign ties.

- Social Movements
  - Active: change something about society
  - Regressive/reactionary social movements: resist social change
  - *Group of people with shared idea who have resources and strong eadership to reach a shared goal and make an impact on society.*
  - Social movements – ex. environmental movement
  - Have impact on their society
  - Social movements seen differently over time
    - Early 20th century: ppl join movement to seek meaning in lives.
    - Social movements are now an instrumental part of evolution of a society
    - Relative Deprivation Theory: Deprivation/inequality will band together to change the inequality
    - Resource mobilization theory: you need to have the resources to fund the movement to publicize, recruit members, and have an impact
    - Rational Choice Theory: patterns and behaviors in society depend on people who weigh different actions and choose the one that benefits them the most
  - Social movements can cause panics or crazes.
  - Two options: fail and fade away or succeed and become integrated in society.

Culture

Culture and Society

- **Culture** is way of life shared by group of individuals – the knowledge, beliefs and values that bind a society together. Very diverse, can include artwork, language, and literature.
    - Ways of of thinking, behaving, and feeling connected to a shared knowledge of a society and allow members of the society to gain meaning from object and ideas around them.
- **Society** is the way people organize themselves – bunch of people who live together in a specific geographic area, and interact more with each other than outsiders. Share a common culture over time.
- Culture = rules that guide way people live, and society = structure that provides organization for people.
    - Society includes **institutions**, ex. family, education, politics, which all meet basic human needs. Society provides structure. Groups of people.
        - Analogy: The hardware on a phone, the actual phone/phone case
    - Culture provides guidelines for living. Culture is learned, reshaped from generation to generation. Culture makes a society run. Rules and input that allow society to run. Way of life of people.
        - Analogy: software or apps on a phone (can't physically be touched) and are constantly being updated.
    - Need *human ideas* from culture to allow a society to work.
        - Analogy: need apps to allow a phone be useful
    - Culture and society need to both exist to function

Overview of Culture

- Society is a group of people and culture talks about rules and instructions within a society that teach them how to live.
- Culture: idea/things passed on between generations in society - Knowledge, beliefs, values, language, and customs. Varies as we travel around the globe.
    - Differences in culture around the globe:
        - Ex: America toothpaste/toothbrush and other cultures use twigs from trees (African cultures)
        - People sleep in beds while others sleep on animal skins or mats
        - English – 500M speakers, Chinese- 1B speakers, Hindi – 480M speakers. 400M Spanish speakers around the world (official language of 20 countries)
        - Many like meat and vegetables, while others eat tofu and grasshoppers.
        - Ways of greeting differ, ex. In Japan they bow, and depth of bow is defined by relative status. And in Europe men and women kiss on both cheeks.

        - Each social unit has a unique way of life due to differences in culture
    - Culture provides guidelines for actions and interactions within a society.
- **4 main points of culture**
    - 1. **People share culture in society**: All people share culture with others in their society, provides rules and expectations for carrying out daily rituals and interactions.
    - 2. **Culture is adaptive** – it evolves over time and adaptive.
        - Normal in hunter/gathers (cooperativity encouraged) different than today's information/technology age (individualism/competition).
    - 3. **Culture builds on itself** – creation of culture is ongoing and cumulative, and societies build on existing cultures to adapt to new challenges and opportunities.
        - Normal values are shaped by your culture. Ex. Putting a baby in a crib is strange in other parts of the world. Culture differs around the world.
    - 4**. Culture is transmitted** – from one generation to the next. We teach a way of life to the next generation. Humans are only mammals with culture to adapt to environments (to survive on equator and artic)
- **High culture** refers to patterns of experiences and attitudes that exist in the highest class segments of a society. This tends to be associated with wealth and formality.
- **Normative culture** refers to values and behaviors that are in line with larger societal norms (like avoidance of crime).
- **Popular culture** refers to patterns of experiences and attitudes that exist within mainstream normative society - like attending a game or watching a parade.

Subculture vs. Counterculture

- Culture – ideas of a society, values beliefs and rules that make up a society.
- **A subculture** is culture (ideas) of a meso-level (medium) sub-community (small community) that distinguishes itself from the larger dominant culture of larger society/community.
    - Subculture smaller than a nation but unlike a **micro-culture**, it is large enough to support people throughout their entire lifespan.
        - Subcultures affect your life on a longer period than a micro-culture
    - **Meso-level** = population size falls between micro and macro levels. They are medium sized groups such as communities, organizations, cities, states, clans, and tribes.
    - It is a sub-community = smaller community in larger one.
        - Subcultures are unique to the larger society but still share some of the culture of the dominant society.
- A **micro-culture** can't support people throughout their lifespan, refers to groups/organizations only affecting limited period of one's life. Ex. Girl scouts, college sororities, boarding school.

- Subcultures include ethnic groups like Mexicans or orthodox Jews, or groups like the elite upper class. Subculture can cause tension with **dominant group**-which have the power to determine the cultural expectations of society.
- When laws of dominant society is violated (conflict with larger culture becomes serious), a **counterculture results**. **Counterculture:** group with expectations and values that strongly disagree with the main values from the larger society. **It refers to a subculture that rejects some of the larger culture's norms and values, and usually develop their own set of norms to live by.**
    - Ex. Mormons believe in polygamy. **Polygamy =** more than one spouse (broader definition), **polygyny** = more than one wife, **polyandry –** woman has multiple husbands
    - Ex. Old Order Amish (PA/OH) reject mainstream ideas and have their own ideas/values, reject technology and consumerism and replace with religious principles (simple lifestyle)

Jim Goes to College Subculture

- National Society is a population of people usually living within a specific geographic area. Connected by common ideas and work towards common goals.
- Within a nation many smaller groups – ethnic, regional, tribal subcultures made of people who identify closely with each other. So a **subculture** is culture of a smaller community that distinguishes itself from larger society.
- Different cities, states, regions in US may have their own unique subcultures.
- Ex. Jim, grew up in Florida his whole life, but got into university in Washington DC. Notices a lot of differences between the two. Ex. Has to Parallel Park, watch for pedestrians, and has to pay for parking. Driving in DC not same as in Florida, much more traffic. Jim learns it is a better option to ride the metro in DC.

Culture Lag and Culture Shock

- **Culture lag** is the fact culture takes time to catch up with technological innovations, resulting in social problems. Common in societies because material culture changes rapidly, while non-material culture tends to resists change.
    - **Material culture** refers to physical and technological aspects of our daily lives, like food and houses, and phones and **non-material culture** (**symbolic culture**) doesn't include physical objects, like ideas/beliefs/values, which tend to resist change.
    - Examples:
        - Many Technology (material culture) outpace cultural adaptation examples
        - Cars first invented no laws to govern driving (no speed limits, no guidelines, lanes, stop signs, stop lights, etc). Very dangerous when cars first started entering roads but laws soon written to fix problem.

        - Computer and emails invented, and businesses took time to use technology.
- **Culture Shock** – feelings of disorientation, uncertainty, or even fear when they encounter unfamiliar culture practices. Ex. Moving countries, move social environments, or travels to another type of life (urban to rural).
    - In foreign places, weather, language, landscape, food, values and customers, way business conducted differently, stores open/close at different times, food can be completely different. Everything you are used to is no longer in place.
    - As a result of culture shock may feel sad, lonely, homesick, confused, etc, and have questioned your decision to move to this new place.
    - Ex. of culture shock: When people from Islamic countries (like Algeria) visit countries in Western Europe (Spain/Italy). Individuals from Islamic countries might experience culture shock when unmarried couples are kissing/holding hands in public and women are wearing what they consider revealing clothing. This would be a culture shock because they are experiencing things different from (in this case frowned upon) in own cultures

Diffusion

- **Diffusion** is the spread of an invention or discovery or ideas from one place to another. Spread of ideas such as Capitalism, democracy and religious beliefs have brought change in human relationships around the world.
    - Spread of music, phone technology, computer hardware/software have made a difference in how people connect with others across the globe.
- Involves expansion of ideas across the globe
- Can occur in many ways.
    - Exploration, military conquest, missionary work, mass media, tourism, internet.
- Ex of Diffusion: Food in America seen all around the world – McDonalds in Asia. Nike in Japan or Australia. Spanish is one of fastest growing languages. Or the ALS ice bucket challenge.
- Diffusion between cultures has occurred throughout history but today it can happen faster because of social media/internet.
- Culture Assimilation: **Cultural assimilation** is interpenetration and fusion of ethnic minorities into the dominant **culture**.

Mass Media

- **Mass media** = dissemination of information, and how information is transmitted within a culture. Includes print media (books, music, newspaper and magazines) and digital media (TV, media, radio, and the internet). How it's consumed changes across cultures in each group. (Ex. Older people might get their info via TV and newspaper while younger people can get it via the internet).
- Can look at the role media plays through society through different sociological perspectives.

- According to the **functionalist perspective**, its main role is to provide **entertainment**. Occupy our leisure time. Also says it can act as an **agent of socialization** (ex. **Collective experience** of watching Olympics on TV, and **community building** – entire internet communities) and act as an **enforcer of social norms.**
    - Also tells us what society expects of us through rewards and punishment, ex. Seeing criminals. But can also glorify behaviours that are wrong in society, like intense physical violence.
    - Also functions as a promoter of **consumer culture**. At the turn of century average US child saw 20000 commercials a year on TV. Only increased from there, and not clear what impact this may have on next generation.
- The **conflict perspective** focuses on how the media portrays and reflects and exacerbate **divisions** that exist in society, ex. Race/ethnicity/gender/social class.
    - Uses term **gatekeeping** to describe the process by which a small number of people and corporations control what information is presented on the media, and describes information (things that appear in newspaper, stories made into movies, what TV shows are turned into pilot) and how the information moves through a series of gates before they reach the public. In some countries this is decided by the government, in others decided by large media corporations.
    - Gatekeeping has more effect on some media than others, ex. Lots of control on big-budget movies, but little overhead control on what's posted online.
    - Also describes how mass media reflects the dominant ideology. Giving time, space or privileging certain political, economic, and social interests at the same time limiting other views. People who make the choice of what media is produced– the **gatekeepers** are predominantly white, male, and wealthy.
    - Portrayal of racial minority groups/LGBT groups, working class people, women (minorities in general), etc. can be underrepresented or stereotyped – unrealistic generalizations of certain groups of people.
        - There have been some attempts to fix underrepresentation/stereotyping
        - But these attempts have sometimes wrongly resulted in **tokenism** instead of diversity. [One minority character is added to a movie as a stand in for the entire group]
- **Feminist Theories** is similar to conflict theory, in that mass media stereotypes/misrepresents society towards the dominant ideology. Specifically, message about men and women are represented in the media. Depictions of men and women often stereotyped, emphasizing traditional sex roles/gender roles.
    - men are considered normal and women are considered the "other". Ex. ("pens" and "pens for her" or "razors" and "razors for women").
    - Women are depicted as victims, men as aggressors
    - Women are depicted as shallow or being obsessed with looks. Makes it more likely they will be sexualized/objectified.
- **Interactionist perspective** looks at mass media on micro-level to see how it shapes day to day behavior. How mass media blurs line between solidary and group activities – ex. watching a movie (can be watching with other people but because of societal

norms/theater rules you can't talk about it with those who you are watching with). Looks at how we connect with others using media changes over time (email/text message instead of phone, or online dating increase).

Evolution and Human Culture

- Culture is the *customs, knowledge, and behaviours* that are learned and socially transmitted. Includes *ideas, values and objects* meaningful to a group of people.
    - Culture is typically learned through **observation**, **interactions**, and the **biological** component (shaped through **evolution**)
- Charles Darwin's Theory of Evolution – both **physical traits** and **behaviours** can be selected for if they contribute to success of the species.
    - Ex. In BIOLOGY: **Physical traits can be selected for**. Interaction between organism and their environment cause finches with long/short beaks on different environments. Animals best suited for their environment have best likelihood to survive in that environment and passing on their genes. Drought causes flowers with seeds that produce only long flowers – birds with long/thin beaks are preferred in their environment over their counterparts and they survive to an age they can produce. If environmental conditions continue – long/thin birds selection over time
        - Ex. **Behaviors can be selected for:** if they contribute to fitness of a species. How do we know which behavior is selected for? Well because there are cultural universals which exist throughout the world for certain things/behaviors which might have been selected for as human species evolved.
        - **Cultural Universals** – Ex. all cultures have ways of dealing with illness/medicine/healing Or wedding/funeral ceremonies. Language (ability to communicate within a group).
- Evolution can shape culture (above universal cultural examples), but can also think of how culture can shape human evolution.
    - Ex. Hunter-gatherer society vs. farming society, people moved less, and populations grew. Because of this people were more exposed to outbreaks of disease. Since only those that survived were the ones not killed by diseases, our culture/these communities helped shape our immune systems.
    - Or lactose intolerance, first year of life most humans get nutrition from milk, but genes to digest this milk are switched after children are weaned. But Northern Europeans which reared cattle, don't have this effect – their lactase gene doesn't turn off. So those able to digest milk more likely to survive. More surviving digesting-milk people so more digesting-milk (lactose tolerant) offspring. They can drink milk/eat dairy products because of ancestors' culture directing evolution.

- **Cultural Transmission:** cultural transmission addresses how culture is learned. Culture is passed along from generation to generation through various childrearing practices, including when parents expose children to music.

Social Inequality

Overview of Social Inequality

- The resources in a society are unevenly distributed. Ex. Wealth in US, top 20% have 72% of the wealth of the country and bottom 20% only control 3%
    - Upper, middle, and lower class. Based on incomes.
    - As you go up the social ladder, have better access to education, healthcare, and housing.
- Groups of population disproportionality affected – **ethnic/racial minorities** have greater degrees of inequality as manifested by lower incomes, lower education, and reduced access to healthcare.
- Those in poverty also face considerable barriers to obtaining the same healthcare, education, and other resources as others.
- Gender does too. Females experience differences in pay (**gender-pay gap**), and the **glass ceiling effect** (poorly represented in higher position in companies)
- People may feel increasingly **socially excluded**, live in **segregated neighbourhoods**, and feel **politically disempowered**.
    - Can lead to civil unrest, and tempt people into criminal activities.
- Ways to help: **government schemes** (ex. Food stamps), improve **access to education/healthcare,** and figure out social interventions that allow **integration to society**.
- Health Disparity: Difference in health outcome that is closely related to social and economic factors. Social inequality causes the difference, not a biological one.

Upward and Downward Mobility,

- We have a number of ways to break down society into social layers, ex. Classes
    - Lower class – manual work, labour, low-pay jobs.
    - Middle class – professionals, better paying jobs
    - Upper class – very wealthy businessmen and family wealth
    - Correlates to amount of income.
- When we think of **social positions**, can there be movement? Yes. Various ways.
    - Individual can move **horizontally / horizontal** mobility– move within the same class. Ex. Accountant switches job to different accounting company.
    - **Vertical movement** /mobility – move up or down the social hierarchy. Ex. Manager at restaurant becomes CEO of fast food restaurant. But if he gets demoted to serving food, fall downwards.
- Various types of social constructs that allow for social mobility.
    - **Caste system** – very little social mobility, because your role is determined entirely by background you're born to and who you're married to. A lot of social stability. Ex. The Hindu caste system.

- **Class system** – allows for degree of social mobility, combination of background and movement, often by education. Less stability.
- **Meritocracy** – concept that people achieve social position solely based on ability and achievements. Highly idealized. Birth/parental background doesn't matter. Extreme social mobility. Equal opportunity.
    - "Social rewards, status, position are awarded to individuals based on their own ability to work (merit). In order for a meritocracy to operate, everyone within the society would need the same opportunity to succeed, so that rewards are actually based (primarily) on merit."
    - It is not necessary for everyone to have the same talent or skill level or outcome. It just means everyone has the same opportunity to achieve. It means achievement is not prescribed at birth (like in a caste system). It means there is a high degree of mobility.
    - Meritocracy is a system under which individuals are rewarded on the basis of individual skill, talent, or achievement.

Inter-Generational and Intra-Generational Mobility, Social Mobility

- If change in social class happens in a person's own lifetime – **intra-generational mobility**.
- **Intergenerational mobility** – change in social class between generations, ex. Parent is working class and son is working class.

Absolute and Relative Poverty

- 2 different ways of thinking about poverty – does it threaten survival of person, or does it exclude them from society?
- **Absolute poverty** – An absolute level at which if you go below, survival is threatened. Minimum level of resources a human being needs to survive. This level no matter where you are.
    - Approx. $1-2 a day, talking about developing countries.
    - However, someone in Arctic needs a lot more than somewhere else. There's variability absolute poverty does not consider.
    - The median level of income in a society can gradually rise as country gets richer. When it does, we find less people live in absolute poverty – decrease in poverty.
- **Relative Poverty** – in developed countries, use a different marker – a % level below the median country of the country. Ex. In Us, instead of $1-2 a day, median income is above $80/day.
    - <60% of the median income.
    - If a country's income rises up, absolute poverty line won't change, median income level would.
    - Relative poverty is not about survival, its people whose incomes are so low in their own society they're being excluded from society.

Social Reproduction

- Huge amount of social inequality between rich families and poor families. Large social inequality seems to replicate itself cross generations. Perpetuation of inequality through social institutions (such as education/economy), social mobility counters this.
- People with rich parents end up wealthy themselves – **social reproduction**.
    - Means we are reproducing social inequality across generations.
- They have **financial capital**, and can invest it to obtain **social capital** – building up reliable, useful social networks.
    - **Social Capital**: the networks of relationships among people who live and work in a particular society, enabling that society to function effectively.
        - **Social Networks provide a valuable resource.** Social capital is believed to result in various health benefits for the individual, including reductions in the health risk of chronic inflammation. Partly related to social support, social capital emphasize the tangible resources provided by network members (whereas social support tends to focus on emotional resources). Both social support and social capital suggest that social contracts will be beneficial to individual health and well-being. Social Network -→ Health
    - **Social Network:** types include:
        - **Peer network**
        - **Family network**
        - **Community network**
- Can also expose you to **cultural capital**, ex. If parents exposing, you to trips abroad and learning foreign languages. Or cultural items in house you know a lot about. With this knowledge you may gain some reward.
    - **Cultural capital** - The term **cultural capital** refers to non-financial social assets that promote social mobility beyond economic means. Examples can include education, intellect, style of speech, dress, or physical appearance. Refers to knowledge, skills, education, and similar characteristics that are used to make social distinctions and that are associated with differences in social status.
- Doesn't educational system allow poor people to gain capital too? Our educational system doesn't value cultures of low classes. It doesn't value the culture and social networks of the poor population.
    - Education system can reinforce this social stratification.
        - **Social Stratification - Social stratification** is a society's categorization of people into socioeconomic strata, based upon their occupation and income, wealth and social status, or derived power (social and political). As such, stratification is the relative social position of persons within a social group, category, geographic region, or social. In modern Western societies, social stratification typically is distinguished as three social classes: (i) the upper class, (ii) the middle class, and (iii) the lower class; in turn, each class can be subdivided into strata, e.g. the upper-stratum, the

middle-stratum, and the lower stratum. Moreover, a social stratum can be formed upon the bases of kinship or caste, or both.

- Four principles are posited to underlie social stratification.
    - First, social stratification is socially defined as a property of a society rather than individuals in that society.
    - Second, social stratification is reproduced from generation to generation.
    - Third, social stratification is universal (found in every society) but variable (differs across time and place).
    - Fourth, social stratification involves not just quantitative inequality but qualitative beliefs and attitudes about social status.
- Complexity - Although stratification is not limited to complex societies, all complex societies exhibit features of stratification. In any complex society, the total stock of valued goods is distributed unequally, wherein the most privileged individuals and families enjoy a disproportionate share of income, power, and other valued resources. The term "stratification system" is sometimes used to refer to the complex social relationships and social that generate these observed inequalities. The key components of such systems are: (a)social-institutional processes that define certain types of goods as valuable and desirable, (b) the rules of allocation that distribute goods and resources across various positions in the division of labor (e.g., physician, farmer, 'housewife'), and (c) the social mobility processes that link individuals to positions and thereby generate unequal control over valued resources.
- Social mobility - Social mobility is the movement of individuals, social groups or categories of people between the layers or strata in a stratification system.
    - Open stratification systems are those that allow for mobility between strata, typically by placing value on the achieved status characteristics of individuals. Those societies having the highest levels of intra-generational mobility are considered to be the most open and malleable systems of stratification. Those systems in which there is little to no mobility, even on an intergenerational basis, are considered closed stratification systems. For example, in caste systems, all aspects of social status are ascribed, such that one's social position at birth is the position one holds for a lifetime.
    - (MARX)

Social Exclusion

- Being an integral member of society has lots of advantages – access to good social networks, housing, educational resources, and resources in community. But certain individuals can be excluded to the peripheries of society, and are prevented from participating in society.
    - Reduced right and access to resources/opportunities
- Some can drag people into the periphery of society
    - The **poverty magnet** can drag people away from the core part of society, and experience a greater degree of social exclusion.
    - The **ill heath magnet** can also drag people away, can't participate in society.
    - Certain groups may face discrimination, based on their race/gender/sexual orientation/etc. – the **discrimination magnet.**
    - **Education, housing, employment** all important factors. With lack of any of these they can be relegated to fringes.
- People in periphery often have many of these magnets combined, have tremendous forces pushing them away. They may also have greater consequences like ill health and criminal activities.
- **Segregation** is a way of separating out groups of people and giving them access to a separate set of resources within the same society
    - Idea **"separate but equal"**, which is rarely true in practice.
    - Segregated people often have **worse resources.**
    - Segregation is maintained by law/public institutions, or more informal processes like "**hidden discrimination**".
    - **Social isolation** – when community voluntarily isolates itself from mainstream, based on their own religious/cultural/other beliefs.

Environmental Justice

- Where we live plays a huge role in environmental benefits and risks we're exposed to.
- Areas with high poverty and lots of racial minorities, often have few environmental benefits (green spaces, parks, recreation).
    - They also get a lot of **environmental burden** compared to wealthier parts. Includes waste facilities, manufacturing/factories, energy production, airports.
    - At risk because they often have few alternatives, little awareness of risks they face, and other pressing issues.
    - More health problems like asthma, obesity, etc.
- Wealthier population society has much higher benefits.
    - More politically and economically powerful, and able to demand beneficial facilities are placed close to them and burdening facilities far way.
    - Also better represented in environmental/lobbying groups.
- Big concept is **environmental justice** – looks at the fair distribution of the environmental benefits and burdens within society across all groups.

Residential Segregation

- Residential segregation – groups of people separate into different neighbourhoods.
    - Can mean race or income.
    - Where we live affects our life chances, because it affects our politics, healthcare, availability to education, etc.
- Other forms of segregation:
    - 1) **Concentration** – there's clustering of different groups
    - 2) **Centralization** – segregation + clustering in a central area.
- **Index of dissimilarity** – 0 is total segregation, and 100 perfect distributions.
- Why is residential segregation important?
    - **Political isolation** - Communities segregated are politically weak because their political interests don't overlap with other communities – become political vulnerable, don't have the political influence to keep their own needs addressed.
    - **Linguistic** isolation - Communities who are isolated may develop own language, even in same city. May limit jobs.
    - Lower access to quality education/heath
    - **Spatial mismatch** – opportunities for low-income people in segregated communities may be present but farther away, and harder to access. Gap between where people live and where opportunities are.

Global Inequality

- The world is extremely unequal.
    - Life expectancy is Congo is 51 vs. France/Japan is 84. Tremendous range.
    - Access to clean water – in Africa, very difficult. In US/Europe very easy.
- Champagne glass can help explain inequalities in wealth we see. It represents the distribution of wealth.
    - Top 1/5th have 82.7% of the global income.
    - Poorest 1/5th have 1.4% of global income.
    - Richest 85 people in world have more wealth than the poorest 3.5 billion people in the world.
- Inequalities in individual countries as well, ex. very poor countries can have a few extremely rich people.
- **Maternal mortality rate** is a marker for healthcare systems.
    - In NA and Europe 10-20 people per 100 000 die of childbirth.
    - In SA 75/100 000
    - SE Asia, 170/100 000.
    - Central Africa 700+/100 000.

Heath and Healthcare Disparities in the US

- A lot of disparities we see in US are result of poor economic and environmental conditions.

    - Social-economic status is a pyramid. As we go up social pyramid, access and quality of healthcare improves.
    - Opposite is true for those at bottom of pyramid – more disease, less high quality healthcare, substandard housing, poor diet, dangerous jobs, can't afford expensive treatments
- **Race** can play a role – Hispanics and African-Americans have higher morbidity and mortality rates, worse access to healthcare and lower quality healthcare.
    - Even though some can be attributed to SES reasons, doesn't explain everything. Minorities less likely to receive everyday healthcare and treatments for life-threatening conditions.
- **Gender** differences – men typically use fewer preventative services like vaccines/check-ups.
    - Women require reproductive services, and access is reduced due to local laws.
    - Studies for treatments for diabetes/heart disease don't always include women, and can suffer from lack of research.
- **LGBT** community – might face discrimination, which can limit clinics they feel comfortable seeking help from.
    - Transgender especially face discrimination, and have a hard time finding someone who has experience working with transgender individuals. Leads them to be reluctant to seek services when they really need them.

Intersectionality

- Many types of discrimination, like sex/gender/culture/race, but what if someone experiences multiple forms at same time?
    - Ex. Female who is African American and practices Buddhist teachings, causing her to be discriminated against in 3 different areas.
    - Why is it important to consider intersection? Because multiple different categories of potential discrimination/oppression that compounds in one individual, and put her at disadvantage in society.
- **Theory of Intersectionality** asks us to consider all the different levels of discrimination. Intersectionality calls attention to how identity categories intersect in systems of social stratification. For example, an individual's position within a social hierarchy is determined not only by his or her social class, but also by his or her race/ethnicity.
    - Originally coined in 1989 by Crenshaw as a feminist theory, but has since expanded out and use it to explain oppression in all parts of society.
- **The theory of intersectionality proposes that we need to understand how all these discriminations (double or triple jeopardy) can simultaneously exist.**

Class Consciousness and False Consciousness

- **Means of production** – way we produce goods, ex. Factories and farms. Owned by fairly wealthy individuals, which hire a large amount of workers which offer their labour, without owning any of the means of production.

    - There's a class divide, a hierarchy of upper/lower class.
- Theory by **Karl Marx** – workers in working class don't realize they're being exploited and oppressed by this capitalistic model of working.
    - Workers can develop **class consciousness**, and realize they have solidarity with one another and struggle to overcome this oppression and exploitation. Involves seizing and obtaining means and redistributing the means of production among the workers.
    - **False consciousness** – unlike class consciousness, instead of seeing they have solidarity with one another, they're unable to see their oppression. And owners can promote this false consciousness by controlling classes, making it more difficult for workers to see their oppression.

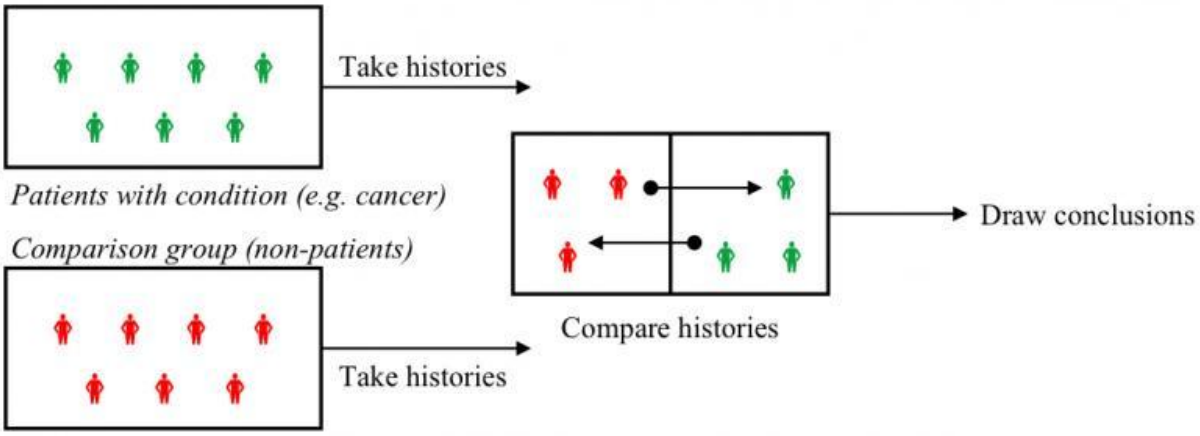
Statistics

- **Regression** – all variables examined are continuous
    - Linear regression – degree of dependence between one variable and another. Data is on scatter plot, one-way influence of one variable on another.
- **Correlation** - all variables examined are continuous. Unlike regression makes no assumptions about which variable is influencing the other.
    - If correlation coefficient is 1, perfect. If -1, opposite. 0, random.
- **Chi-square** – when all variables are categorical, looks at if 2 distributions of categorical data differ from each other.
    - Null hypothesis vs. alternative hypothesis.
- **T-test** – compares mean values of a continuous variable (dependent) between 2 categories/groups, ex. comparing mean of a group to a specific value. Can also compare means of 2 groups.
    - Two-tailed = possibility of relationship in both directions, one-tailed = one direction.
- **ANOVA** – similar to t-test, compare distributions of continuous variable between groups of categorical variable, but can be used for 3+ groups.
- If value doubles, 100% increase

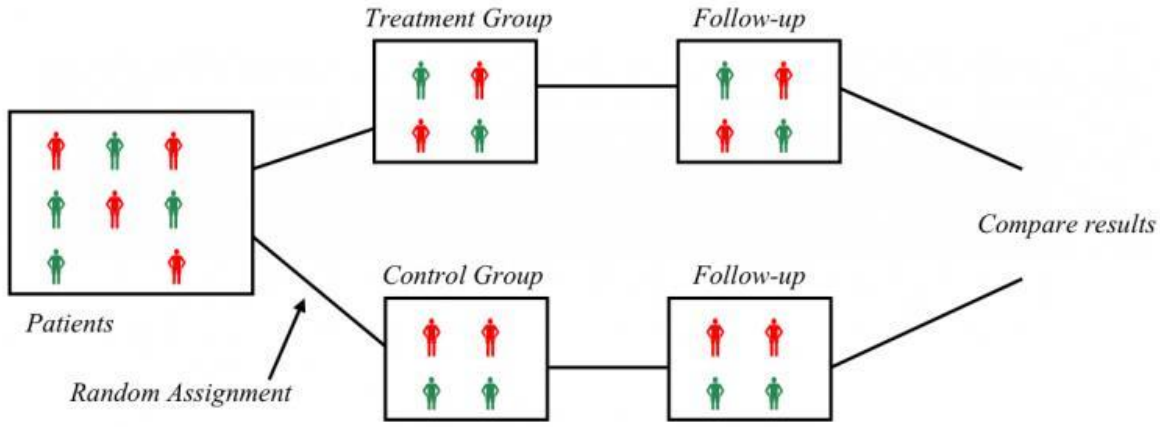
Study Types

- **Cross-sectional study –** look at a group of different people at one moment in time
- **Cohort study** – following a subset of population over a lifetime. A cohort is a group of people who share a common characteristic (ex. people born and exposed to same pollutant/drug/etc.) in period of time.
    - A retrospective cohort design looks back at events that have already taken place.
    - **A prospective cohort design follows a group of individuals over a period of time.**
- **Longitudinal study** – data is gathered for the same subjects repeatedly over a period of time, can take years or decades. A longitudinal study follows variables over a long period of time to look for correlations.

- **Case-control study** – observational study where 2 groups differing in outcome are identified and compared to find a causal factor. Ex. comparing people with the disease with those who don't but are otherwise similar.



- **Clinical trial** - highly controlled interventional studies
- **Randomized Controlled Trial** – people studied randomly given one of treatments under study, used to test efficacy/side effects of medical interventions like drugs. Gold standard for a clinical trial.



- **Experimental Study** - would involve manipulation of variables, which was not present in this study. Would have independent and dependent variables.
- **Quasi-Experimental Design** - A quasi-experimental design is similar to an experimental design but lacks random assignment. This type of design describes an effect on a specific cohort of the population.
- **3x2 factorial design (read "three by two")** - we have three levels of the first variable crossed with two levels of the second variable. Such a design gives us 3x2=6 treatment conditions in the experiment. Two independent variables, 3 of first, 2 of 2nd.
- **Observational Study** - In an observational study, the researcher is unable to control the assignment of groups.

Unformatted Extras

- Correlations: Strength of a correlation is based on how close the correlation coefficient is to 1 or -1. Correlations can only range between 1 and -1.
    - Negative Correlation: <0, >-1, -1 = strong negative correlation. A negative correlation is a relationship between two variables in which one variable increases and the other decreases.
    - Positive Correlation >0, <1, +1 = strong positive correlation. A positive correlation is a relationship between two variables: as one increases, the other also increases.
    - **A correlation coefficient that is below -1 is likely the result of an error by the experimenter when computing the correlation between developmental dyslexia and illiteracy.**
- Regression to the mean is a phenomenon in which, over time, scores become more average.

Self-Report Study: Cheap and not labor intensive. Potential for poor reliability, vulnerable to subjective interpretation, hard to compare w/ those from other measures. A **self-report study** is a type of survey, questionnaire, or poll in which respondents read the question and select a response by themselves without researcher interference. A *self-report* is any method which involves asking a participant about their feelings, attitudes, beliefs and so on. Examples of self-reports are questionnaires and interviews; self-reports are often used as a way of gaining participants' responses in observational studies and experiments.

Self-report studies have validity problems. Patients may exaggerate symptoms in order to make their situation seem worse, or they may under-report the severity or frequency of symptoms in order to minimize their problems. Patients might also simply be mistaken or misremember the material covered by the survey.

- Often use semi-structured interview style with follow up questions and pre-set questions set.
- Closed questions – provide quantitative data, no insights
- Open questions – qualitative data – ask participant to answer in own words

Validity

- **Validity** – accuracy. Items that are high in validity accurately address the construct. “ACTUALLY GETTING AN SNSWER FOR SOMETHING YOU WISH TO MEAUSRE”
- **Internal Validity** – extent to which a causal conclusion based on a study is warranted. Confounding factors often impact the internal validity of an experiment.
- **External validity** – Whether results of the study can be generalized to other situations and other people. To protect external validity, sample must be completely random, and all situational variables must be tightly controlled.

- **Population Validity:** Population validity is a type of external validity which describes how well the sample used can be extrapolated to a population as a whole. Generalizability.
- **Ecological Validity:** Ecological validity is a type of external validity which looks at the testing environment and determines how much it influences behavior.

- Internal vs. External Validity: Internal validity describes the extent that a study is able to show a cause-effect relationship between the variables tested in the study. External validity describes the extent that the results of a study can be generalized or repeated in multiple settings.
- Test validity is an indicator of how much meaning can be placed upon a set of test results.
  - Criterion Validity assesses whether a test reflects a certain set of abilities. "IS the test valid" Criterion validity refers to whether a variable is able to predict a certain outcome.
    - *Concurrent validity* measures the test against a benchmark test and highcorrelation indicates that the test has strong criterion validity. **Concurrent validity measures how well a test matches up with a benchmark test, which is usually another valid measure of the same construct.**
    - *Predictive validity* is a measure of how well a test predicts abilities. It involves testing a group of subjects for a certain construct and then comparing them with results obtained at some point in the future. **Predictive validity**, or the extent to which an assessment is able to predict something it should be able to predict
  - **Construct validity** – Construct validity describes the extent to which the theory is supported by the data or results of the research. "Does the test have results that's supported by what is expected" construct validity- how the terms are defined.
  -
    - **Convergent Validity:** tests that constructs that are expected to be related are, in fact, related.
    - *Discriminant validity* tests that constructs that should have no relationship do, in fact, not have any relationship. (also referred to as divergent validity)
  - **Content validity** describes the extent that the test measures the construct accurately. Is the estimate of how much a measure represents every single element of a construct. **Content validity**, or the extent to which an assessment measures the entire construct fully. "Does the test measure what its supposed too?" Content validity is a measure of comprehensiveness and examines whether or not a test covers every single element of a construct.

- Face validity is a measure of how representative a research project is 'at face value,' and whether it appears to be a good project the degree to which a lay person who takes a cursory look at an experiment agrees that an experimenter is measuring what they say they are measuring.

- **Regression to the mean** – if first measurement is extreme, second measurement will be closer to the mean
- **Confounding variables** – changes in dependent variable may be due to existence of or variations in a third variable
    - A confounding variable is a third variable in an experiment that could provide an alternative explanation to the relationship between the variables of interest.
- Dependent Variable: A dependent variable is expected to change based on the manipulation of the independent variable.
- Independent Variable: what is manipulated
- An independent variable in a study is manipulated, whereas the dependent variable is the factor in a study that is expected to change based on manipulation. The executives are manipulating price and expect to see changes in sales.
- **Temporal confounds** – time related confounding variables
- **Reliability** – consistency in answers across participants. Reliability is the degree to which an assessment tool produces stable and consistent results. CONSISTENT RESULTS WITH REPEATED EXPERIMENTS.
- **Validity**: Refers to the extent to which a measure reflects the phenomenon being studied. Should not use proxy measurements (should be direct). Should measure construct directly.
- **Test-retest reliability** is shown by a high positive correlation between the first and second administration of a test. **Retest reliability**, or consistency when a measure is taken multiple times.
- **Inter-rater reliability**, or consistency when two different people measure the same thing,

The good-subject tendency refers to the tendency of participants to act according to what they think the experimenter wants.
A participant's role demands refers to the expectations of the participant regarding what an experiment necessitates him or her to do.

Generalizing to a population. Sometimes when scientists talk about generalizability, they are applying results from a study sample to the larger population from which the sample was

selected. For instance, consider the question, “What percentage of the Canadian population supports the Liberal party?” In this case, it would be important for researchers to survey people who represent the population at large. Therefore they must ensure that the survey respondents include relevant groups from the larger population in the correct proportions. Examples of relevant groups could be based on race, gender or age group.

Couterbalancing: method to control for any effect that the order of presenting stimuli might have on the dependent variable.

Types of Control

- **Vehicular control** – what experimental group does without the directly desired impact
- **Positive control** – treatment with known response
- **Negative control** – group with no response expected

Error Types
Type I
Type II
Power
Alpha:
Null Hypothesis: A null hypothesis is a statement that suggests there is no relationship between two variables.
Alternative Hypothesis
Confidence Interval
Variance
Beta

A **confidence level** refers to the percentage of all possible samples that can be expected to include the true population parameter. For example, suppose all possible samples were selected from the same population, and a confidence interval were computed for each sample. A 95% confidence level implies that 95% of the confidence intervals would include the true population parameter.

68-95-99.7 rule

Types of Bias:

- **Bias:** Failure to be objective
- **Hindsight bias**, also known as the knew-it-all-along effect or creeping determinism, is the inclination, after an event has occurred, to see the event as having been predictable, despite there having been little or no objective basis for predicting it.
- **“Cant Happen to me” Bias aka Normalcy Bias** - “causes people to underestimate both the possibility of a disaster occurring and its possible effects.

- **Reconstructive bias** is a type of bias related to memory. Most research on memories suggests that our memories of the past are not as accurate as we think, especially when we are remembering times of high stress.
- **Attrition bias** occurs when participants drop out of a long-term experiment or study.
- **Social desirability bias** is a type of bias related to how people respond to research questions.
- **Selection bias** refers to a type of bias related to how people are chosen to participate
- **Subjective Bias:** Self-reported information is always vulnerable to subjective bias.
- **Implicit bias** - refers to the attitudes or stereotypes that affect an individual's understanding, actions, and decisions in an unconscious manner. These biases, which encompass both favorable and unfavorable assessments, are activated involuntarily and without an individual's awareness.
- **Cognitive bias** is the tendency to think in certain ways. Cognitive biases often cause deviations from a standard of rationality or good judgment.
- **Social Desirability Bias**

Other:

- **Survey: Surveys provide a way to sample and measure**
- **Content Analysis: Content analysis** is a method for summarizing any form of **content** by counting various aspects of the **content**.
- **Network analysis:** Social **network analysis** (SNA) is the process of investigating social structures through the use of **network** and graph theories.
- **Participant observation:** In **participant observation** the observer participates in ongoing activities and records observations. Participant observation extends beyond naturalistic observation because the observer is a "player" in the action.
-
- **Reactivity: "**Because the observer is a participant in the activities and events being observed, it is easy to influence other people's behavior, thereby raising the problem of **reactivity** -- influencing what is being observed."
- **Qualitative:**
- **Quantitative**
- **Ethics of studies:**
- **Operationalization /operationalized -** is the process of strictly defining variables into measurable factors. The process defines fuzzy concepts and allows them to be measured, empirically and quantitatively. Allows for the establishment of a causal relationship between variables. You want to manipulate the variable at varying levels for this to occur.
-
- Embedded Field Study – when researchers pose as participants
- Retrospective Chart Study- examine past charts
- Prospective chart study – look @ charts as they come
-

- **Concurrent Validity**
- **Leading Questions**
- **Demand Characteristics - https://en.wikipedia.org/wiki/Demand_characteristics**
- **Split-Half Method**
- Unidirectional Relationship – cause -→ effect
- Reciprocal Relationship- --- cause ←→ effect
- Reciprocal exchange
- Reciprocity - **reciprocity** is a social rule that says we should repay, in kind, what another person has provided us.[1] That is, people give back the kind of treatment they have received from you. By virtue of the rule of reciprocity, we are obligated to repay favors, gifts, invitations, etc. in the future. If someone remembers us on our birthday with a gift, a reciprocal expectation may influence us to do the same on their birthday. This sense of future obligation associated with reciprocity makes it possible to build continuing relationships and exchanges. Reciprocal actions of this nature are important to social psychology as they can help explain the maintenance of social norms.
    - Individuals who benefit from the group's resources without contributing any skills, helping, or resources of their own are called free riders. Both individuals and social groups often punish free riders, even when this punishment results in considerable costs to the group.[3] So, it is unsurprising that individuals will go to great lengths to avoid being seen as a moocher, freeloader, or ingrate.[1]
- **Response Rate**
- **Ambiguity of questions**

brought into being (why or how it happened).

Word Association Testing
Implicit Association Testing
Operational Span Testing
Psychophysical discrimination testing (Psychophysics): **Psychophysics** quantitatively investigates the relationship between physical stimuli and thesensations and perceptions they affect.

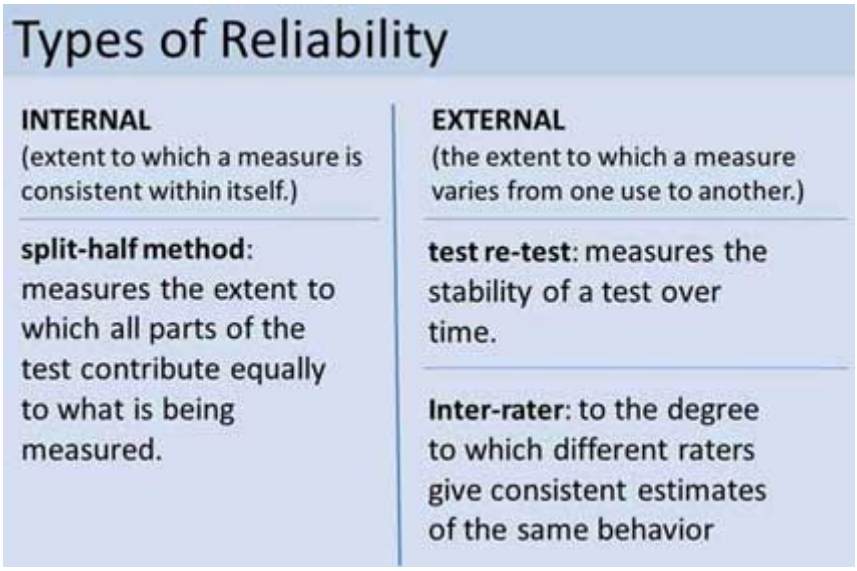
In statistics, **sampling bias** is a bias in which a sample is collected in such a way that some members of the intended population are less likely to be included than others. It results in a **biased sample**, a non-random sample[1] of a population (or non-human factors) in which all individuals, or instances, were not equally likely to have been selected.[2]If this is not accounted for, results can be erroneously attributed to the phenomenon under study rather than to the method of sampling.

Analyzing tests:

Validity: Validity is arguably the most important criteria for the quality of a test. The term validity refers to whether or not the test measures what it claims to measure. On a test with high validity the items will be closely linked to the test's intended focus. For many certification and licensure tests this means that the items will be highly related to a specific job or occupation. If a test has poor validity then it does not measure the job-related content and competencies it ought to. When this is the case, there is no justification for using the test results for their intended purpose. There are several ways to estimate the validity of a test including content validity, concurrent validity, and predictive validity. The face validity of a test is sometimes also mentioned.

Standardized:
A **standardized test** is any form of test that (1) requires all test takers to answer the same questions, or a selection of questions from common bank of questions, in the same way, and that (2) is scored in a “standard” or consistent manner, which makes it possible to compare the relative performance of individual students or groups of students. While different types of tests and **assessments** may be “standardized” in this way, the term is primarily associated with large-scale tests administered to large populations of students, such as a multiple-choice test given to all the eighth-grade public-school students in a particular state, for example.

Reliable: Reliability is one of the most important elements of test quality. It has to do with the consistency, or reproducibility, or an examinee's performance on the test. For example, if you were to administer a test with high reliability to an examinee on two occasions, you would be very likely to reach the same conclusions about the examinee's performance both times. A test with poor reliability, on the other hand, might result in very different scores for the examinee across the two test administrations. If a test yields inconsistent scores, it may be unethical to take any substantive actions on the basis of the test. There are several methods for computing test reliability including test-retest reliability, parallel forms reliability, decision consistency, internal consistency, and interrater reliability. For many criterion-referenced tests decision consistency is often an appropriate choice.


Types of Reliability
INTERNAL
(extent to which a measure is consistent within itself.)
split-half method: measures the extent to which all parts of the test contribute equally to what is being measured.
EXTERNAL
(the extent to which a measure varies from one use to another.)
test re-test: measures the stability of a test over time.
Inter-rater: to the degree to which different raters give consistent estimates of the same behavior

Fairness:
The fairness of an exam refers to its freedom from any kind of bias. The exam should be appropriate for all qualified examinees irrespective of race, religion, gender, or age. The test should not disadvantage any examinee, or group of examinees, on any basis other than the examinee's lack of the knowledge and skills the test is intended to measure. Item writers should address the goal of fairness as they undertake the task of writing items. In addition, the items should also be reviewed for potential fairness problems during the item review phase. Any items that are identified as displaying potential bias or lack of fairness should then be revised or dropped from further consideration.

Two aspects of generalizability
Generalizing to a population. Sometimes when scientists talk about generalizability, they are applying results from a study sample to the larger population from which the sample was selected. For instance, consider the question, “What percentage of the Canadian population supports the Liberal party?” In this case, it would be important for researchers to survey people who represent the population at large. Therefore they must ensure that the survey respondents include relevant groups from the larger population in the correct proportions. Examples of relevant groups could be based on race, gender or age group.

Generalizing to a theory. More broadly, the concept of generalizability deals with moving from observations to scientific theories or hypotheses. This type of generalization amounts to taking time- and place-specific observations to create a universal hypothesis or theory. For instance, in the 1940s and 1950s, British researchers Richard Doll and Bradford Hill found that 647 out of 649 lung cancer patients in London hospitals were smokers. This led to many more research studies, with increasing sample sizes, with differing groups of people, with differing amounts of

smoking and so on. When the results were found to be consistent across person, time and place, the observations were generalized into a theory: “cigarette smoking causes lung cancer.”

Requirements for generalizability

For generalizability we require a study sample that represents some population of interest — but we also need to understand the contexts in which the studies are done and how those might influence the results.

Suppose you read an article about a Swedish study of a new exercise program for male workers with back pain. The study was performed on male workers from fitness centres. Researchers compared two approaches. Half of the participants got a pamphlet on exercise from their therapist, and half were put on an exercise program led by a former Olympic athlete. The study findings showed that workers in the exercise group returned to work more quickly than workers who received the pamphlet.

Assuming the study was well conducted, with a strong design and rigorous reporting, we can trust the results. But to what populations could you generalize these results?

Some factors that need to be considered include: How important is it to have an Olympian delivering the exercise program? Would the exercise program work if delivered by an unknown therapist? Would the program work if delivered by the same Olympian but in a country where he or she is not well-known? Would the results apply to employees of other workplaces that differ from fitness centres? Would women respond the same way to the exercise program?

To increase our confidence in the generalizability of the study, it would have to be repeated with the same exercise program but with different providers in different settings (either worksites or countries) and yield the same results.

Social group has been **defined** as two or more people who interact with one another, share similar characteristics, and collectively have a sense of unity. Other theorists disagree however, and are wary of **definitions** which stress the importance of interdependence or objective similarity.”collection of people with common identity and regular interactions, is not as specific as a reference group”

- **Exogamy** is a social arrangement where marriage is allowed only outside a social group. The social groups define the scope and extent of **exogamy**, and the rules and enforcement mechanisms that ensure its continuity.
- **Endogamy** is the practice of marrying within a specific ethnic group, class, or social group, rejecting others on such a basis as being unsuitable for marriage or for other close personal relationships.
- **Homogamy** is marriage between individuals who are, in some culturally important way, similar to each other. **Homogamy** may be based on

socioeconomic status, class, gender, ethnicity, or religion, or age in the case of the so-called age **homogamy**.
    - **Heterogamy** is a marriage between two individuals who are culturally different.
    - **Homophily -** the tendency for people to choose relationships with other people who have similar attributes. people often prefer mixing with those who are similar to themselves.
    - **Homophilous social network is similar to reference group.**
- Preferred-mixing indicates how there are high levels of contact among people who share similar attributes.
    - Antecedent predisposition
    - Social subjectivity
    - Deviance theory

- The **orbitofrontal cortex** is associated with the processing of both positively and negatively balanced emotions. When activity is lowered in the right hemisphere, euphoria is experienced. Conversely, when activity is lowered in the left hemisphere, depression is reported. (acronym: think of a HAPPY right handed Olivia ORBITing the FRONT of space). Vision, taste, olfaction, and touch are all first integrated in the orbitofrontal cortex.
- The recognition of facial expressions associated with sadness have been linked to the **subcallosal cingulate. (mnemonic:** think of SUBway loving "Better CALLoSAL (a SINGLLEulate man)" as being sad)
- The **insula** and **basal ganglia** are most often associated with disgust. (acronym: Parkinson's disease (basal ganglia) people never feel disgusted and are INSULATED)
    - The **insula** is the brain structure most associated with disgust. The anterior insula receives signals from the senses of olfaction and gustation (mouth/nose are in front of body), while the posterior insula receives signals from audition and somatosensation (rear of body)
- **Anger** has been associated with the **left superior temporal sulcus.** (acronym: ANGRY budda w/ LEFT toe missing @ The SUPERIOR TEMPLE Sucks/sulcs "
    - Damage to the basal ganglia causes problems recognizing angry facial expressions.

- The link system utilizes order and connections (links) to facilitate memory recovery.

- **Writing down information helps to reinforce the memory, but it is not a chunking technique.**

Prosopagnosia is a neurological disorder characterized by the inability to recognize familiar people based on facial information alone. (acronym: prosopagnosia = PEOPLE)

The fusiform gyrus is a part of the visual system in the brain, and plays a role in high level visual processing and recognition. (part of temporal and occipital lobe)

The temporal lobes are responsible for processing auditory signals, interpreting visual stimuli, and language recognition.

The parietal lobes are responsible for spatial reasoning and receiving somatosensory information.

Visual agnosia is a disorder of the ventral pathway, because it is an inability to recognize an image. (acronym: **V**isual = **V**entral)

Synthestasia - a neurological phenomenon in which stimulation of one sensory or cognitive pathway leads to automatic, involuntary experiences in a second sensory or cognitive pathway.

Ca2+ = indicator of chelation. This positively charged ion is extremely versatile. A rise in this ion, postsynaptically, in dendritic spines is essential for activity-dependent plasticity. This ion is an important second messenger in the neuron. Abnormal amounts of signaling in this ion has been implicated in disease states such as Huntington's, Alzheimer's and schizophrenia.

Informed Consent
Beneficence /nonmalifiscence/autonomy

Antipsychotics are a class of psychiatric medication primarily used to manage psychosis(including delusions, hallucinations, paranoia or disordered thought), principally for schizophreniaand bipolar disorder, and are increasingly being used in the management of non-psychotic disorders. Both types block dopamine pathways and cause Parkinson like symptoms. **(also treat anxiety with dementia, OCD, and anxiety disorder).**

Typical Antipsychotics used to treat psychiatric conditions. **Neuroleptics**. Decrease positive symptoms of schizophrenia but can increase negative symptoms. First generation.

The **atypical antipsychotics** (**AAP**; also known as **second generation antipsychotics** (**SGAs**)) are a group of antipsychotic drugs (antipsychotic drugs in general are also known as **major** tranquilisers**). Block serotonin as well. Less likely to cause extrapyramidal motor control disability (negative symptoms increase) . these have increased risk of stroke, cardiac death, blood clot and diabetes.**

- The **Thomas theorem** is a theory of sociology which was formulated in 1928 by W. I. **Thomas** and D. S. **Thomas** (1899–1977): " If men define situations as real, they are real in their consequences. " In other words, the interpretation of a situation causes the action. (acronym: if Thomas the train is defined as real, it becomes real in consequence)

- **Haptic perception** is the exploration of objects through touch, most often by the hand or fingers.
- **Active touch** occurs when a person uses haptic perception to actively inspect an object.
- **Adaptation** is at the sensory level, and habituation is at the perceptive/cognitive level
- **Phantom pain** is the perception of pain in an area of the body, which has been removed or lost due to injury.
- **Tonotopy** is the special mapping of sound frequencies that are processed by the brain, also called the tonotopic map.
- The **dermatome** is an area of skin with sensory nerve fibers from a single posterior spinal root ganglion.
- The **connectome** is a neural map of the connections within the brain.
- **The homunculus is a cortical body map of how different areas of the skin are represented in the primary somatosensory cortex (S1).**
- **Interference** occurs when the participant takes longer to read a word because it is emotionally charged than a neutral word.
- In psychology, the **Stroop effect** is a demonstration of interference in the reaction time of a task. When the name of a color (e.g., "blue", "green", or "red") is printed in a color not denoted by the name (e.g., the word "red" printed in blue ink instead of red ink), naming the color of the word takes longer and is more prone to errors than when the color of the ink matches the name of the color.
- Agoraphobia – fear of open spaces, crowds, etc

LSD – serotonin neurotransmission
Nicotine – CNS stimulant by working as a acetylcholine agonist.
Amphetamine – dopamine reuptake blocked
Alcohol – CNS depressant

Schizophrenia
Positive symptoms are delusions, neologisms, and hallucinations.
Negative symptoms describe loss of emotional affect and social withdrawal.
Mesolimbic – positive effects of schizophrenia
Mesocortical – negative effects of schizophrenia
Dopamine release in the tuberoinfundibular pathway inhibits prolactin release in the pituitary.
The nigrostriatal pathway is associated with motor planning and purposeful movement
The mesolimbic pathway is associated with reward, motivation, and many of the positive symptoms of schizophrenia.

Hypochondriac - a person who is abnormally anxious about their health.

Illness anxiety disorder - Individuals diagnosed with illness anxiety disorder are often more concerned with illness or the idea of being ill and often lack or have minimal somatic symptoms.

The DSM-5 describes paraphilia as any intense and persistent sexual interest other than genital stimulation or fondling in phenotypically normal, physically mature, and consenting human partners. Paraphilias include sexual sadism (inflicting humiliation, bondage, or suffering), masochism (being humiliated, bound, or suffering), transvestic (sexually arousing cross-dressing, in addition to voyeurism (spying on others) and frotteurism (touching or rubbing genitals against a non-consenting individual), and pedophilia (sexual focus towards children).

- A teratogen is a substance or environmental factor that can disrupt normative fetal development.
- Phenylketonuria is a genetic problem; consumption of diet soda during pregnancy would not directly cause phenylketonuria.
- Polycystic kidney disease is a genetic problem.
- Autism spectrum disorder is not a birth defect.
- **Fetal alcohol syndrome is directly related to the consumption of alcohol during pregnancy.**

Neuropeptide Y in humans inhibit the feeding circuit blocking satiety. The inhibition caused by peptide Y may cause the inhibition of other neurotransmitters such as cholecystokinin (CCK), which limits meal size by sensing the distention of the duodenum. This may cause eating without being sensitive to the signals that the individual is full.

The **paraventricular nucleus** (PVN, PVA, or PVH) is a neuronal nucleus in the hypothalamus. It contains groups of neurons that can be activated by stressful and/or physiological changes. Many PVN neurons project directly to the posterior pituitary where they release oxytocin or vasopressin into the general circulation. Other PVN neurons control various anterior pituitary functions, while still others directly regulate appetite and autonomic functions in the brainstem and spinal cord.

Short-term maturation effects are physiological changes that can affect outcome measurements.
Repeated testing that leads to extreme measurements becoming more normal is called regression toward the mean.

Sensory stimulus is more referring to the type of information being received by your receptors which elicits a response... i.e.: light, heat, touch, sound, etc.

Proximal stimulus is the stimulation that actually occurs when your sensory receptors are activated... the neural activity.
Distal stimulus is the actual stimulus or object in the real world that you end up sensing and then perceiving, which results in the proximal stimulus.

- **Proximal Stimulus**: In perception, the proximal stimulus refers to physical stimulation that is available to be measured by an observer's sensory apparatus. It can also refer to the neural activity that results from sensory transduction of the physical stimulation are the patterns of stimuli from these objects and events that actually reach your senses (eyes, ears, etc.)
- **Distal stimuli** are objects and events out in the world about you. The **distal stimulus** is an object which provides information for the proximal **stimulus**.

- The **distal stimulus** is an object which provides information for the proximal stimulus. The **proximal stimulus** registers, via sensory receptors, the information given by the distal stimulus.

    - An example would be a person looking at a shoe on the floor. The shoe itself is the distal stimulus. The image recorded onto the person's retina (sensory receptor) is proximal stimulus.

    - Another example would be a telephone ringing. The ringing of the telephone is the distal stimulus. The sound being recognized and understood as the ringing of a telephone, by our sensory receptors, is the proximal stimulus.

- **Word Association** is a common word game involving an exchange of words that are associated together. The game is based on the noun phrase **word association**, meaning "stimulation of an associative pattern by a word" or "the connection and production of other words in response to a given word, done spontaneously as a game, creative technique, or in a psychiatric evaluation
- Psychophysical Testing Methods /Psychophysics - directly assess our perception of stimuli in relation to their true physical properties. **Psychophysics** quantitatively investigates the relationship between physical stimuli and the sensations and perceptions they affect. Psychophysics has been described as "the scientific study of the relation between stimulus and sensation" or, more completely, as "the analysis of perceptual processes by studying the effect on a subject's experience or behaviour of systematically varying the properties of a stimulus along one or more physical dimensions".
    - **Methods of Limits**- In the ascending method of limits, some property of the stimulus starts out at a level so low that the stimulus could not be detected, then this level is gradually increased until the participant reports that they are aware of it. For example, if the experiment is testing the minimum amplitude of sound that can be detected, the sound begins too quietly to be perceived, and is made gradually louder. In the descending method of limits, this is reversed. In each case, the threshold is considered to be the level of the stimulus property at which the stimuli are just detected.

        - In experiments, the ascending and descending methods are used alternately and the thresholds are averaged. A possible disadvantage of these methods is that the subject may become accustomed to reporting that they perceive a stimulus and may continue reporting the same way even beyond the threshold (the error of habituation). Conversely, the subject may also anticipate that the stimulus is about to become detectable or undetectable and may make a premature judgment (the error of anticipation).
    - **Method of Constant Stimulation**- Instead of being presented in ascending or descending order, in the method of constant stimuli the levels of a certain property of the stimulus are not related from one trial to the next, but presented randomly. This prevents the subject from being able to predict the level of the next stimulus, and therefore reduces errors of habituation and expectation. For 'absolute thresholds' again the subject reports whether he or she is able to detect the stimulus. For 'difference thresholds' there has to be a constant comparison stimulus with each of the varied levels.
    - **Method of Adjustment- method of average error -** The method of adjustment asks the subject to control the level of the stimulus, instructs them to alter it until it is just barely detectable against the background noise, or is the same as the level of another stimulus. This is repeated many times. This is also called the method of average error. In this method the observer himself controls the magnitude of the variable stimulus beginning with a variable that is distinctly greater or lesser than a standard one and he varies it until he is satisfied by the subjectivity of two. The difference between the variable stimuli and the standard one is recorded after each adjustment and the error is tabulated for a considerable series. At the end mean is calculated giving the average error which can be taken as the measure of sensitivity.

- Practice effects are considered a common subtype of order effects. Practice effects can be defined as influences on performance that arises from a practicing a task (Heiman, 2002). Even after practice trials are performed in/for a study, participants have a tendency to perform initial trials poorly because they are still not warmed up to it (Heiman, 2002). Performance can, however, improve after more trials are conducted because this allows participants to become more accurate and a lot quicker. Participants' performance may decrease again, however, because they do have a tendency to become bored and/or fatigued after a while.

- "An order effect is an influence on a particular trial that arises from its position in a sequence of trials" (Heiman, 2002). Usually when one provides a series of questions for participants in a study, they run at risk for having an order effect. *Practice effects* usually occur when the participants find the questions to be either novel or have great reactivity. However, if there is a long list of questions, an increase in boredom is most likely to occur (Heiman, 2002). The same occurs for *carry-over effects*, when participants respond in a more biased manner to later questions because of any earlier

questions. *Response sets* can also occur over repeated closed-ended questions (Heiman, 2002).

https://en.wikipedia.org/wiki/Sound_localization
The interaural time difference describes the difference in time it takes a sound to reach the left vs the right ear.
The interaural level difference describes the difference in sound pressure level between the ears. The head dampens the overall sound to the far ear and reduces the intensity of the high frequency tones, but not the low frequency tones.
All of the points on the cone of confusion have the same interaural level difference and interaural time difference.

- The neurotransmitter, GABA, works as the primary inhibitory neurotransmitter.
- Dopamine has many functions but is most often associated with reward, learning, and attention.
- Serotonin also has many functions but is most often associated with mood, appetite, social behavior, and memory.
- **The primary role of hypocritin also called orexin in the CNS is to control sleep and arousal.**

Temporal Monotocity: Temporal monotonicity assumes that adding pain at the end of a painful experience (in this case extending the painful experience) will worsen the retrospective evaluation of the experienced pain and adding pleasure at the end will enhance the retrospective evaluation.

Posner and Snyder described an action as automatic if the action did not affect other mental activities.

The buildup of acetaldehyde causes symptoms such as nausea, headache, flushing of the face, and internal organ damage.

Glutamate is associated with increased cortical arousal.
Excessive sleepiness, which can be caused by a large sleep debt, is a consequence of the accumulation of adenosine. Cells responsible for arousal are inhibited by adenosine monophosphate (AMP).
Phosphodiesterase decomposes cAMP into AMP.

Caffeine inhibits an enzyme that breaks down cyclic adenosine monophosphate (cAMP). The increase in cAMP increases glutamate production. This increase in cellular activity results in action potentials that are briefer and released in bursts. (just remember cAMP = ON/SIGNALLING). Broken by phospodiester to AMP (a nucleotide)

- Most perception of warmth occurs the insula. (Acronym: Warm is insulated)

The cingulate cortex may be important in the perception of annoyance.(acronym: Sad Single Collosal)

- Spreading activation finds the shortest circuit. Asymmetry occurs because of STDP (Spike Time Dependent Plasticity); the synapse that fires regularly is strengthened in that direction, while the other synapse direction is weakened.

- Functional neuroimaging, one type of 'brain scanning', involves the measurement of brain activity. The specific technique used to measure brain activity depends on the imaging technology being used (see fMRI and PET for examples). Regardless of which technology is used, the scanner produces a 'map' of the area being scanned that is represented as voxels. Each voxel typically represents the activity of a particular coordinate in three-dimensional space. The exact size of a voxel will vary depending on the technology used, although fMRI voxels typically represent a volume of 27 mm^3 (a cube with 3mm length sides).

- Anomia is a form of aphasia identified by the inability to name everyday objects.
- Agraphia is a form of aphasia characterized by the loss of the ability to form graphemes, which causes a loss in the ability to communicate via writing.

- **The McGurk effect** is a categorical change in auditory perception that occurs whenever the auditory stimulus does not match the visual stimulus during speech perception.

- **Melodic Intonation Therapy (MIT).** MIT works best with non-fluent forms of aphasia.

- Receptive aphasia is a fluent aphasia. A person will be able to read or hear; however, she will be unable to understand the meaning of the communication. = Wernicke's aphasia is a fluent aphasia. The person will be able to produce language; however, the words will come out as 'word salad' or fluently connected speech that lacks meaning.

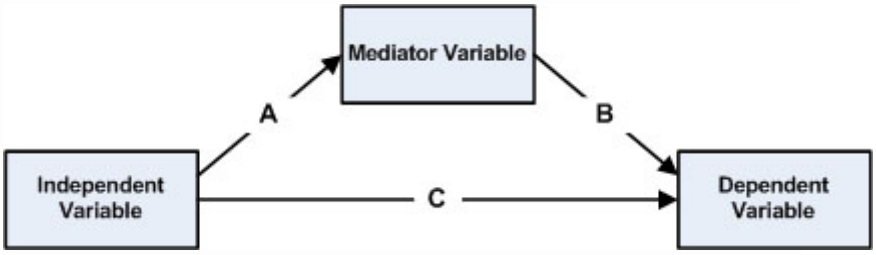
- A global aphasia is often the result of damage to a large portion of the left hemisphere. This person will have difficulty producing speech, understanding speech, and will likely be unable to read or write.

- Broca's aphasia is a non-fluent form of aphasia. A person with Broca's aphasia will be unable to produce speech, but will be able to understand verbal speech.

Risk factor vs protective factors

Next Step Notes:
https://www.youtube.com/watch?v=B2-TKZnq7fk

- **Mediating Variable:** A mediating variable specifies a given cause (original predictor variable, independent variable) that works indirectly through a more direct cause (mediator variable) to a final effect (outcome variable, dependent variable). The mediator adds to the overall variance accounted for in the data and can explain how the dependent and independent variables are related. A mediating variable is one which explains the relationship between two other variables. "RELATIONSHIP between two variables" EXPLAINS WHY OR HOW the relationship
    - **Explains the relationship between IV and DV**
    - **IV accounts for variations in DV**
    - **IV variations account for variations in mediator**
    - **Mediator variation account for variations in DV**
    - **When mediator is added to the mode, the relationship between the IV and DV decreases**



- **Moderating Variable:** A moderating variable is a variable that specifies conditions under which a given predictor is related to an outcome. The moderator explains 'when' a dependent and independent variable are related. A moderator variable is one that influences the strength of a relationship between two other variables.
    - **Changing the strength or direction of the relationship between IV and DV**
    - **Does not explain why there is a relationship between IV and DV**

- **Confounding Variable**: A confounding variable is a hypothetical or real third variable that is often not taken into account during analysis and can adversely affect the study. : A confounding variable is one which is not typically of interest to the researcher but is an extraneous variable which is related to BOTH the dependent and independent variables.
    - **IV is not CAUSING the confounding variable is the difference between a COUNFINDING VARIABLE and a MEDIATING VARIABLE (In a mediating variable the mediating variable CAUSES a confounding variable).**

- **Heterophily** is the tendency of individuals to collect in diverse groups; it is the opposite of homophily.
- is correct. GABA is the chief inhibitory neurotransmitter in the CNS. It plays the principal role in reducing neuronal excitability throughout the nervous system and is found in decreased levels in patients with anxiety disorders. There are three basic molecules, known chemically as monoamines, which are thought to play a role in mood regulation: norepinephrine, serotonin and dopamine. The hypothalamus uses these neurotransmitters as it manages the endocrine system.
- The amygdalae are golf ball shaped groups of nuclei located within the temporal lobes of the brain. They serve to assist in the processing of memory, decision-making, and emotional reactions.
- **Aversive conditioning** is a behavioral conditioning technique in which noxious stimuli are associated with undesirable or unwanted behavior that is to be modified or abolished.
- **Social cue** is a vocal or non-vocal suggestion, which can be positive or negative. These cues guide conversation and other social interactions. A few examples of social cues include: facial expression, tone of voice and body language.

AAMC Additional:

- **Beck's Cognitive therapy** (**CT**) is a type of psychotherapy developed by American psychiatrist Aaron T. Beck. CT is one of the therapeutic approaches within the larger group of cognitive behavioral therapies (CBT) and was first expounded by Beck in the 1960s. Cognitive therapy is based on the cognitive model, which states that thoughts, feelings and behavior are all connected, and that individuals can move toward overcoming difficulties and meeting their goals **by identifying and changing unhelpful or inaccurate thinking, problematic behavior, and distressing emotional responses**. This involves the individual working collaboratively with the therapist to develop skills for testing and modifying beliefs, identifying distorted thinking, relating to others in different ways, and changing behavior
- **Opponent-process theory** is a psychological and neurological model that accounts for a wide range of behaviors, including color vision.
- The **diathesis–stress model** is a psychological theory that attempts to explain behavior as a predispositional vulnerability together with stress from life experiences. The termdiathesis derives from the Greek term (διάθεσις) for disposition, or vulnerability, and it can take the form of genetic, psychological, biological, or situational factors.[1] A large range of individual differences exist between persons in their vulnerability to the development of disorder.[1][2]
- **Ethical Research**: requires that all participants voluntarily participate in the study. At any point, participants should be able to freely withdraw their participation and their data can then no longer be used.

- **Socioeconomic Status**: defined as consisting of income (or wealth), educational attainment, and/or occupational status
- Socioeconomic Gradient: Refers to the negative coorelation between socioeconomic status and po
- **Ethnographic Research**: involves observing social interactions in real social settings.
    - **For example**: studying the experience of role strain through observation can increase our understanding of how physicians cope with the challenging demands of extending life with interventions while accepting the reality of death.
    - **Ethnography** (from Greek ἔθνος ethnos "folk, people, nation" and γράφω grapho "I write") is the systematic **study** of people and cultures.
- interventional experiment
- **Comparative Study/Research: Comparative research** According to D.E Sanga (2004) Cooperative research is a research methodology in the social sciences that aims to make comparisons across different countries or cultures. A major problem in comparative research is that the data sets in different countries may not use the same categories, or define categories differently (for example by using different definitions ofpoverty).
- **The Flynn effect** is an observation regarding the growth of IQ from one generation to the next.
-
- Emotional intelligence is the ability to understand emotions present in oneself and how those emotions motivate oneself and others.
- Median: less susceptible to variation (when compared to mode)
- Egoism: Egoism (also known as psychological egoism) is a philosophical concept in which the motivations and instincts for an individual's behavior are based on their own self-interest and welfare. It is the belief that all of our behaviors and actions are based on the benefit that we will receive from it. This is contrasted with psychological altruism which proposes that some human actions are based on the desire to help other people.

  Read more: http://www.alleydog.com/glossary/definition.php?term=Egoism#ixzz46lzvMk2G

Prevalence
Etiology
Power
Data stratification

- Cross's Nigrescence Model:
    - Pre-encounter
    - Encounter
    - Immersion/Emersion

    - Internalization
    - Internalization-Commitment

- Conditioned memory is a type of memory that is formed based on your associations between two things. For example, if your professor rings a bell at the end of the exam, you will remember the bell as the sign that the exam is over.

- **Minority influence** occurs when a smaller group over time is able to persuade the majority to join their side. A type of social influence, this topic was researched in depth by Moscovici. Minority influence uses conversion as a means for the minority group to be influential- conversion is convincing someone who originally doesn't agree with your views that you are right.
    - Examples of minority influence include the Suffragette and Civil Rights movements in the United States. These originated within a smaller group who over time were able to convince the majority to sympathize and agree with their side.
    - When a new idea arises, it is automatically a minority opinion. This idea can then be spread through the influence of the minority on others accepting this view.
- **Multiple Approach-Avoidance** describes the internal mental debate (sometimes called a conflict) that weighs the pros and cons of differing situations that have both good and bad elements. The name comes from visualizing yourself approaching and avoiding different aspects of situations at the same time.
    - An example would be choosing between two different cars, each with differing pros and cons. One car gets great gas mileage and has lots of fancy stuff (approaching) but is very expensive and expensive to maintain (avoidance). The other car is cheap and cheap to maintain (approaching) but very boring and won't last long term (avoidance). Your mind will weigh these different options and eventually come to a decision based on the information you considered. As humans this is a very common internal debate that we use daily, from choosing what food to eat (healthy food vs. tasty junk food) to where we will live (country vs. city).
- **Approach-approach conflicts** two options are both appealing.
- **Avoidant-avoidant conflicts** both options are unappealing
- An **approach-avoidance conflict** is when one option has both aspects, but here there are two options.
- **Double approach-avoidant conflicts** consist of two options with both appealing and negative characteristics, which seemed to represent the jury's dilemma. If they ruled the defendant guilty, then they could be punishing a criminal(approach) or maybe punishing an innocent(avoidant). If they ruled the defendant innocent, then they would be letting a criminal walk away unpunished(avoidant) or freeing an innocent (approach).

Cialidini's Six key principles of influence

1. **Reciprocity** – People tend to return a favor, thus the pervasiveness of free samples in marketing. In his conferences, he often uses the example of Ethiopia providing thousands of dollars in humanitarian aid to Mexico just after the 1985 earthquake, despite Ethiopia suffering from a crippling famine and civil war at the time. Ethiopia had been reciprocating for the diplomatic support Mexico provided when Italy invaded Ethiopia in 1935. The good cop/bad cop strategy is also based on this principle.
2. **Commitment and Consistency** – If people commit, orally or in writing, to an idea or goal, they are more likely to honor that commitment because of establishing that idea or goal as being congruent with their self-image. Even if the original incentive or motivation is removed after they have already agreed, they will continue to honor the agreement. Cialdini notes Chinese brainwashing on American prisoners of war to rewrite their self-image and gain automatic unenforced compliance. Seecognitive dissonance.
3. **Social Proof** – People will do things that they see other people are doing. For example, in one experiment, one or more confederates would look up into the sky; bystanders would then look up into the sky to see what they were seeing. At one point this experiment aborted, as so many people were looking up that they stopped traffic. See conformity, and the Asch conformity experiments.
4. **Authority** – People will tend to obey authority figures, even if they are asked to perform objectionable acts. Cialdini cites incidents such as the Milgram experiments in the early 1960s and the My Lai massacre.
5. **Liking** – People are easily persuaded by other people that they like. Cialdini cites the marketing of Tupperware in what might now be called viral marketing. People were more likely to buy if they liked the person selling it to them. Some of the many biases favoring more attractive people are discussed. See physical attractiveness stereotype.
6. **Scarcity** – Perceived scarcity will generate demand. For example, saying offers are available for a "limited time only" encourages sales.
    1. While conveying scarcity, in general, can influence others, in the case of an opinion, the more people that agree, the more likely others are to follow, so scarcity is not desirable.

- Spatial Discrimination-
  The ability to perceive as separate points of contact the two blunt points of a compass w hen applied to the skin.

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